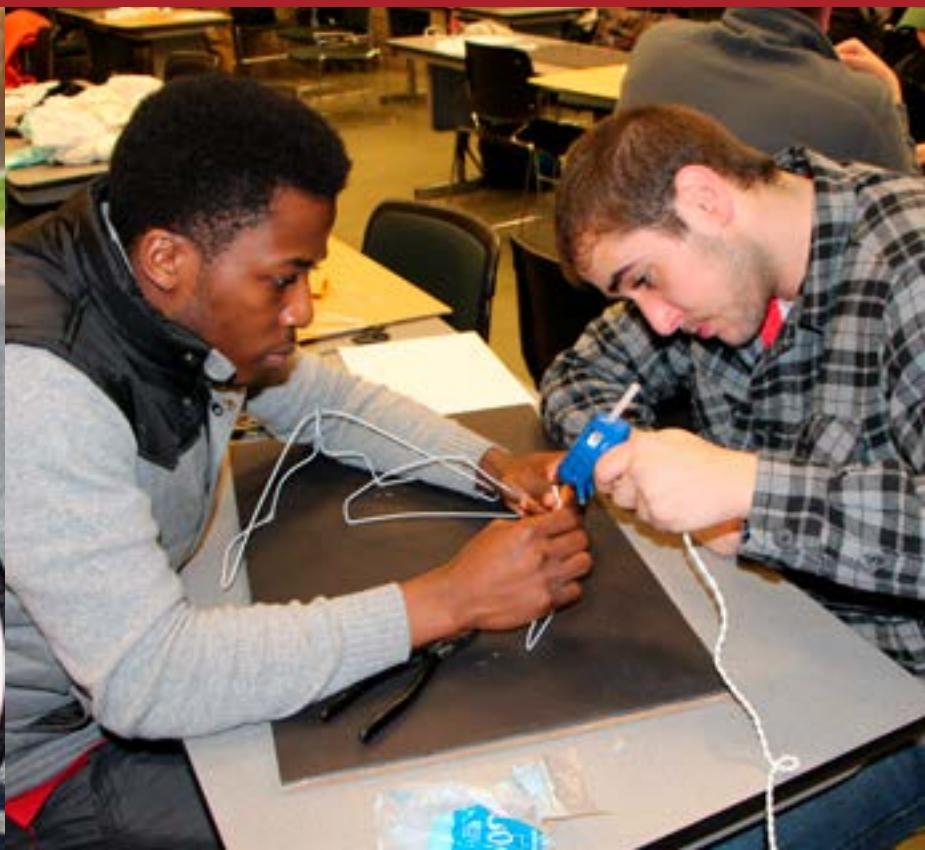




DUNWOODY  
COLLEGE OF TECHNOLOGY

*2018-2019*  
Catalog/Student Handbook



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# CATALOG/STUDENT HANDBOOK

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## Welcome to Dunwoody!

The Dunwoody Student Catalog and Handbook is your online resource to academic programs, services, policies and procedures.

Please take a minute to review the catalog and familiarize yourself with this important information. Information provided about our academic programs provides students with a general list of requirements needed to qualify for a degree.

The catalog is published yearly and serves as a snapshot of Dunwoody at the time of publication in August. Changes that occur after publication will be included in the next catalog.

We are committed to ensuring that your educational experience here at Dunwoody is a positive one.

Thank you.

# ABOUT DUNWOODY

Since 1914, Dunwoody has been a place where the curious and the confident have learned by doing. We pioneered the way technical education should be taught: by educating students on the latest technology that is in use in the real-world, so our graduates have the skills employers are looking for.

Located on the western edge of downtown Minneapolis, Dunwoody is the only private, not-for-profit technical college in the Upper Midwest. We have graduated more than 200,000 alumni who have been crucial to the development of the local and regional economy. Many of them have become respected industry leaders and entrepreneurs, and all of them have created a legacy of achievement that can literally be seen in the Minneapolis skyline, across the state of Minnesota, and beyond.

Today, our graduates enter the workforce with competence and confidence, determined to start meaningful and rewarding careers.

Dunwoody offers certificates, associate's degrees, and bachelor's degrees in more than 45 majors in the following areas:

- Automotive
- Business
- Computer Technology
- Construction Sciences & Building Technology
- Design & Graphics Technology
- Health Sciences & Technology
- Robotics & Manufacturing
- School of Engineering

## Accreditations

### Overview

Dunwoody College of Technology is approved by a number of regulatory agencies both at the institutional and programmatic levels. Institutional approvals are required for Dunwoody to conduct business. All education offered in the United States and the financial aid to support students in pursuing their education is regulated by the Department of Education (DOE). The function of accrediting and monitoring institutions of higher education both in their compliance with federal financial aid standards and in the quality of the education delivered, the DOE delegates to approved regional and national accrediting bodies. Dunwoody is accredited by the DOE approved regional accreditor, The Higher Learning Commission. Dunwoody is located in the State of Minnesota and as such must demonstrate compliance with all Minnesota laws and standards both in regard to state financial aid and quality of the education being delivered in the state. As such, Dunwoody is registered with the Minnesota Office of Higher Education. Programmatic approvals are carried out by professional accrediting bodies associated with a specific area of expertise. Dunwoody programs in seeking and attaining programmatic accreditation demonstrate compliance with the standards of excellence within the given profession.

## The U.S. Department of Education (DOE)

The United States Department of Education's mission is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access. Public

Law 96-88 outlines four major activities for which the Department is responsible:

1. Establishes policies relating to federal financial aid for education; administers distribution of those funds and monitors their use
2. Collects data and oversees research on American Schools and disseminates this information to Congress, educators and the general public
3. Identifies the major issues and problems in education and focuses national attention on them
4. Enforces federal statutes prohibiting discrimination in programs and activities receiving federal funds and ensures equal access to education for every individual

## The Higher Learning Commission (HLC)

Dunwoody College of Technology is accredited by the Higher Learning Commission (HLC). The HLC was founded in 1895 as one of six regional institutional accreditors in the United States. The HLC is recognized as an accreditor by the U.S. Department of Education and the Council of Higher Education Accreditation (CHEA) and is required to conduct programmatic approval for dissemination of financial aid. All Dunwoody programs obtain approval by the Higher Learning Commission for financial aid eligibility. The Higher Learning Commission's telephone number is (800) 621-7440; the website is [www.hlcommission.org](http://www.hlcommission.org) (<http://www.hlcommission.org>).

## Minnesota Office of Higher Education (MOHE)

The Minnesota Office of Higher Education is a cabinet-level state agency providing students with financial aid programs and information to help them gain access to postsecondary education. The agency serves as the state's clearinghouse for data, research and analysis on postsecondary enrollment, financial aid, finance and trends. Through collaboration with systems and institutions, the agency assists in the development of the state's education technology infrastructure and library programs. The mission of MOHE is to advance the promise of higher education to all Minnesotans and to provide the critical information that guides higher education decisions.

Dunwoody College of Technology is registered with the Minnesota Office of Higher Education pursuant to Minnesota Statutes Sections 136A.61 to 136A.71. Registration is not an endorsement of the institution. Credits earned at the institution may not transfer to all other institutions.

Dunwoody College of Technology is registered as a private, non-profit college offering programs in Minnesota on three levels: certificate, associate degree and bachelor's degree. This registration is renewed annually. Programmatic review and approval is also required of and provided by MOHE for state and federal financial aid.

Dunwoody's financial aid involvement with MOHE includes the following:

- Minnesota State Grant Program
- Minnesota Child Care Program
- Minnesota GI Bill Scholarship Program
- Minnesota Indian Scholarship Program
- Minnesota Work-Study Program
- Minnesota Self Loan Program

## Programmatic Accreditors Include

### ABET, Inc

ABET (<http://www.abet.org>) is a non-profit accrediting body for college and university programs in applied science, computing, engineering, engineering technology.

### ASE Education Foundation

The ASE Education Foundation (<http://www.ase.com/Landing-Pages/Students-Teachers/ASE-Education-Foundation.aspx>) is a non-profit organization that examines the structure and resources of training programs and evaluates them against nationally-accepted standards of quality.

### Council for Interior Design Accreditation (CIDA)

The Council for Interior Design Accreditation (CIDA) (<http://accredit-id.org>) is a non-profit accrediting organization for interior design education programs at colleges and universities in the United States and internationally.

### HVAC Excellence

HVAC Excellence (<https://www.escogroup.org/hvac>) is an organization established to improve the technical competency of the HVACR industry. This is accomplished through the validation of the technical education programs.

### Joint Review Committee on Education in Radiologic Technology (JCERT)

The Joint Review Committee on Education in Radiologic Technology (JCERT) (<https://www.jcert.org>) is the agency recognized for the accreditation programs in radiography, radiation, therapy, magnetic resonance and medical dosimetry.

### National Institute for Metalworking Skills (NIMS)

The National Institute for Metalworking Skills (NIMS) (<https://www.nims-skills.org/accreditation?q=web/nims/5>) is metalworking trade association that sets skills standards for the industry, certifies individual skills against the standards, and accredits training programs that meet NIMS standards.

## Letter from the President

Dear prospective and current students:

Thank you for your interest in Dunwoody College of Technology. We are delighted you are considering or have selected Dunwoody as your gateway to a better future.

For more than 100 years, Dunwoody has built a reputation as a leader in technical education. We have educated more than 200,000 men and women. Many of our graduates go on to become leaders in their respective industries, or become entrepreneurs who own and operate their own businesses.

Dunwoody's mission is to "change lives by building opportunities for graduates to have successful careers, to develop into leaders and entrepreneurs and to engage in 'the better performance of life's duties'." We strive to achieve this mission every day by living up to high standards in the way we teach and support our students. I am confident the Dunwoody team Admissions counselors, instructors, student advisors, and staff will deliver on that goal.

I wish you the best of luck in your chosen field of study. We will challenge you to achieve your maximum potential; you must challenge us to reach ours as well.

Rich Wagner, Ph.D.  
Dunwoody College of Technology President

## Mission, Vision, Core Values & Freedom of Expression

### Statement of Mission and Goals

#### Vision

Dunwoody College of Technology seeks to emerge as a first-choice, nationally-recognized leader in technical education, providing a full college experience rooted in innovative education.

#### Mission

Dunwoody changes lives by building opportunities for graduates to have successful careers, to develop into leaders and entrepreneurs, and to engage in "the better performance of life's duties."

*Quote is from the Last Will and Testament of William Hood Dunwoody.*

#### Strategic Goals

- Growing the College
- Developing the Dunwoody student
- Raising the profile

#### Values

##### Inclusion

We value an inclusive and collaborative learning and working environment.

##### Innovation

We value innovation in our processes, problem solving, teaching, and learning.

##### Integrity

We value personal and institutional integrity based on mutual respect, trust, and accountability.

##### Excellence

We value excellence in teaching and learning by upholding the principles of continuous quality improvement.

##### Tradition

We value the founding traditions of Dunwoody and seek to build on those traditions for a stronger future.

## Freedom of Expression

In accordance with its Mission, members of the Dunwoody community are expected to develop into leaders and entrepreneurs. This goal is often accomplished through normal activities of Dunwoody students, staff, faculty and administration while learning and working in an environment of Inclusion, Innovation, Integrity, Excellence and Tradition.

Dunwoody strives to create an environment in which diverse opinions can be expressed and heard. Members of the Dunwoody community have the right to peacefully express their views and opinions, regardless of whether others may disagree, but not in such a way as to prevent the

speaker's freedom of expression or interfere with the college operation.  
Views expressed should not violate any of Dunwoody's policies or values.

# ACADEMIC PROGRAMS

## Academic Philosophy

Dunwoody College teaches problem solving and critical thinking along with practical, real-world skills that are much sought after by business and industry. It's a rigorous style of hands-on, applied learning that requires discipline and personal responsibility. The emphasis is on understanding the basic theory and skills in lecture courses and then getting practice applying those skills in hands-on lab work with labs and shops that use equipment and processes that mirror what is found in industry.

The College also fosters such values as work ethic, teamwork, and punctuality. It prepares graduates to enter the diverse, performance-oriented, and modern workplace by requiring students to take Arts & Sciences courses in addition to technical curriculum.

This applied approach to learning has been part of Dunwoody since its founding in 1914 and was championed by the College's first director Charles Prosser, who is known as the father of vocational education in the United States.

## Degree Offerings

Dunwoody offers certificate, Associate in Applied Science, and Bachelor degree programs.

### Associate of Applied Science (A.A.S.) and Certificates

Dunwoody offers a variety of two year AAS degrees which include technical and Arts & Sciences courses and prepare students for a career in a specific industry. A variety of certificate programs are also offered some of which are stackable.

### Baccalaureate Degrees

Dunwoody offers bachelor degree completion programs as well as stand-alone Bachelor of Science and Bachelor of Architecture.

## Alternate Course Formats

Various delivery methods can be used for some Arts & Sciences and technical courses. Students may need to connect with the instructor on the first day of the course in order to determine access, navigation, participation, and course requirements. Students are expected to adhere to time frames as dictated by the course syllabus. Standard drop/add deadline and time frames for withdrawing apply to all types of delivery.

Directed study is granted only under specific circumstances.

## Statutory Requirements

Federal Program Integrity – 2011

### Definition of a Credit Hour (600.2)

"(1) One hour of classroom or direct faculty instruction and minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or (2) At least an equivalent amount of work as required in paragraph (1) of the definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours."

For Certificate Programs eligible for clock-to-credit hour conversion [668.8(k)(1)&(l)] "A semester hour must include at least 37.5 clock hours of instruction." Exception provided allowing a lesser rate of conversion based on additional student work outside of class. The institution's student work outside of class combined with the clock hours of instruction must meet or exceed the numeric requirements of the standard conversion minimum. If the exception is implemented, the conversion parameter for hours in class is reduced to "A semester hour must include at least 30 clock hours of instruction."

## General Principles

1. The academic year will be two 18 week semesters and one 9 week summer session
  - An 18 week semester can include 18 weeks of general instruction.
  - Within the 18 weeks is included time for experiential learning activities such as the Phoenix Challenge for Printing and Skills USA competition open to all Dunwoody programs and students.
2. The credit hour will be calculated on a 50 minute nominal hour. Scheduling of classes will be made on a 55 minute clock hour to accommodate for instructional time lost due to the scheduled holidays within an academic year.

## Credit Allocation by Category

The following categories will be used to assign credits

Category	Delivery Methods	Definition
Lecture	Face-to-Face, Distance, Hybrid <sup>1</sup>	One credit equals one nominal hour in combination of face-to-face or distance/hybrid instruction with a minimum of two nominal hours of out of class student work (homework and application) each week for approximately 18 weeks for one semester for a total of 54 Clock Hours.



Laboratory	Laboratory, Studio, Seminar	One credit equals three nominal hours of laboratory/studio work (1:54) with little or no out of class student work each week for approximately 18 weeks for one semester or 54 Clock Hours or One credit equals two nominal hours of laboratory/studio work (1:36) with a minimum of one nominal hour of out of class student work each week for approximately 18 weeks for one semester for a total of 54 Clock Hours.
Experiential	Practicum, Capstone, Internship, Clinical, Directed Study, Travel Study	One credit shall be awarded for a minimum of 54 Clock Hours in combination of experiential learning, instruction and out of class student work as indicated on the course syllabus.
Combination	Lecture/Lab, Lecture/Studio, Lecture/Practicum, Etc.	Consistent with Dunwoody's Instructional Delivery Model, a combination of the categories may be used. In some cases, laboratory or studio may replace homework time, allowing in class time for application and competency demonstration

<sup>1</sup> A program cannot have more than 50% of Distance learning without approval from HLC.

## Dunwoody Instructional Delivery Model

Dunwoody College of Technology has a long history of applied, hands on learning. Although a variety of instructional delivery methods are used to meet the students' instructional needs, the most common delivery method is still hands on application. The standard instructional model is lecture followed by application with demonstrated competency. As such a combination of lecture/lab is the most common form of delivery.

## Definition of Delivery Methods

### LECTURE (FACE-TO-FACE)

A lecture is formal instruction, conducted on or off campus by the instructor, applying any combination of instructional methods. This definition is applicable only when the course organization requires that the instructor bear the primary responsibility for the instructional activity and is directly involved with all students in the class. Students are

expected to work on out-of-class assignments on a regular basis over the length of the course.

### LECTURE (DISTANCE)

#### Department of Education Definition

Distance education means education that uses one or more of the following technologies:

1. to deliver instruction to students who are separated from the instructor
2. to support regular and substantive interaction between the students and the instructor, synchronously or asynchronously

The technologies used may include:

1. the internet
2. one way and two way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices
3. audio conferencing
4. videocassettes, DVDs, and CD-ROMS, if the videocassettes, DVDs or CD-ROMs are used in conjunction with any of the technologies listed in clauses (1) through (3)

#### Higher Learning Commission Definition of Course and Program

Distance-delivered courses are those in which all or the vast majority (typically 75% or more) of the instruction and interaction occurs via electronic communication, correspondence, or equivalent mechanisms, with the faculty and students physically separated from each other.

Distance-delivered programs are those certificate and degree programs in which 50% or more of the required courses may be taken as distance-delivered courses.

#### Dunwoody Definition for Distance Learning

Distance Learning Program = 50% or more of the total program content (total hours and courses) delivered via distance learning. This means that 50% or more of the content delivered in the program is delivered to students who are separated from the instructor and technology is used to support regular and substantive interaction between the students and the instructor, synchronously or asynchronously. The same 50% or more rule applies to courses where 50% or more of the course content is offered through the use of technology with the student separate from the instructor, with interaction supplemented by technology.

50% or more of a course/program with the instructor/student separated = distance learning

49% or less of a course/program with the instructor/student separated = not distance learning

### LECTURE – HYBRID

Hybrid courses will have a mix of distance and face-to-face instruction. The hybrid classification directs that the students and instructor are in the same physical space for more than 50% of the instructional time with the remainder of the instructional time provided through distance education as defined above.

### LABORATORY

A laboratory is an educational experience where students conduct experiments, develop skills, or practice procedures under the supervision of a faculty member.

## STUDIO

A studio is an educational environment where students work on individual or group projects under the guidance of a faculty member. Projects may vary in scope, content and length.

## SEMINAR

A seminar has the function of bringing together a group of students, under the guidance of an instructor, for recurring meetings, focusing each time on a particular subject related to their program's field of study. Active participation by the student is required. The seminar provides an opportunity for readings or practical problems to be discussed, debated or questioned.

## Experiential Delivery Methods

These delivery methods take place at an alternative facility or off campus, such as an internship, travel study or clinical, and cannot comprise more than 25% of the overall program requirements, which includes both Technical and Arts & Sciences courses.

## PRACTICUM

A practicum is an educational experience replicating what a student would do on-the-job; applying previous or concurrent knowledge guided by an instructor where the student demonstrates content proficiency of a specific area within a program of study.

## CAPSTONE

A capstone is a major project related to a student's area of study that demonstrates a student's overall content knowledge of the program outcomes. The student has a faculty member set as the advisor for the project.

## INTERNSHIP

An internship is a supervised educational work experience, located on or off campus at a work site where a faculty member monitors and provides final assessment.

## CLINICAL

A clinical applies only to Health Sciences & Technology programs. This type of credit is awarded to a student assigned to a clinical experience off-campus in which the student is under constant supervision by a clinical instructor. The clinical experience will typically be in a healthcare setting such as a hospital, clinic or nursing home. The clinical instructor may be a practicing clinician in the field of study or faculty member of the College. Students should receive individual instruction and critique in their performance. The faculty member coordinating the clinical experience provides the final grade for each student based in part on input from the clinical instructor.

## DIRECTED STUDY

A directed study is a course in which the student must meet a specific set of objectives (leading to the successful completion of a course competency) agreed upon by the instructor and the student. The course requires one-on-one instructional conferences.

## TRAVEL STUDY

Travel study is an educational experience that combines travel and cultural study as a main competency within the student's program of study.

## Core Abilities

Dunwoody College of Technology believes that there are certain abilities and attributes every student graduating from a Dunwoody program should demonstrate regardless of their field of study. They are integral to success in the workforce and emulate the overarching mission, vision and values of the College. These abilities and attributes will be taught, encouraged, and assessed throughout their program of study, both in Arts & Science and Technical classes. Every Dunwoody graduate will be able to:

### Apply Math Skills (TIED TO THE VALUES: MISSION, VISION)

Criteria include:

1. Perform technically appropriate computations
2. Calculate using information from graphs and charts
3. Compute applied calculations
4. Conduct measurements properly
5. Use formulas to conduct calculations

### Communicate Effectively (Tied to All Values)

Criteria include:

1. Demonstrate active listening skills
2. Consider audience and adapt communication
3. Use technology to communicate effectively
4. Write/render clearly, concisely, and accurately
5. Speaks clearly, concisely, and accurately
6. Use non-verbal responses in a professional manner
7. Produce accurate technical documentation
8. Apply correct source citations

### Demonstrate Personal Integrity (TIED TO THE VALUES: INTEGRITY, EXCELLENCE, TRADITION)

Criteria include:

1. Take responsibility for his/her own learning and actions
2. Choose ethical courses of action
3. Complete quality work without supervision
4. Exhibit respect for people and property
5. Demonstrate civic responsibilities
6. Demonstrate professional behavior
7. Cope with change effectively

### Use Critical/Creative Thinking (TIED TO THE VALUES: INNOVATION, INTEGRITY, EXCELLENCE)

Criteria include:

1. Analyze observed data in a creative way to make decisions
2. Apply scientific process to solve problems

3. Refine plans based on feedback
4. Combine ideas or information in new ways
5. Identify goals, generate alternatives, gather information, weigh pros and cons, and choose best alternative

## Use Technology Productively (TIED TO THE VALUES: MISSION, INNOVATION, EXCELLENCE)

Criteria include:

1. Use tools associated with your discipline proficiently
2. Exhibit flexibility and receptivity through changing technologies
3. Distinguish when technology is useful or not useful in your career field

## Respect Diversity (TIED TO VALUES: MISSION, INCLUSION, TRADITION, INTEGRITY)

Criteria include:

1. Demonstrate respect for the opinions, customs, and individual differences of others
2. Display an appreciation for various forms of cultural expressions
3. Appreciate social contributions by people of diverse populations

## Work Collaboratively (TIED TO VALUES: VISION, INCLUSION, EXCELLENCE)

Criteria include:

1. Contribute to a group with ideas, suggestions and effort
2. Work toward agreements which involves exchanging resources
3. Understand group dynamics
4. Take individual ownership in a collaborative environment
5. Provide and accept constructive feedback

## Academic Plan

The academic plan is a degree progress tracking tool that displays both Arts & Sciences and Technical course requirements for a program, of which the student is currently enrolled. The academic plan shows what has been completed, what is in progress, and what is left to do in order to satisfy academic requirements for graduation.

The academic plan also has a 'What If' feature, that allows for a student to view how completed courses will satisfy requirements of other programs, of which the student may not yet be enrolled.

Students should monitor their progress toward their declared degree or certificate path using the academic plan on [my.dunwoody](https://my.dunwoody.edu/my/Home.aspx) (<https://my.dunwoody.edu/my/Home.aspx>). This plan may also be used by faculty, program managers/deans, and Student Affairs advisors in advising sessions.

## Business Department

- Business Management & Leadership (AMGT), Bachelor of Science (p. 10)

## Business Management & Leadership (AMGT), Bachelor of Science

The Applied Management program is a bachelor's completion program designed for graduates of technical colleges who have earned an AAS or AS degree or equivalent. Graduates are well-positioned to move into managerial or other senior positions or start their own businesses in a variety of technical industries. Students take business and management courses such as Managerial Accounting, Quality Systems, Leadership, and Entrepreneurial/Marketing Management.

The degree is also designed to enhance business soft skills such as communication, business writing, and human relations. Courses are taught by faculty members who have extensive industry experience along with the appropriate degrees and certifications in their field of expertise.

All courses are distance learning. As such the U.S. Department of Veterans Affairs considers this to be a distance learning program, which may affect the benefits of some veterans. This program is only available to residents of Minnesota.

A concentration in Management Information Systems (MIS) is also available.

**Credential Earned:** BS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening and Distance Learning

**Available Starts:** Fall Semester; Spring Semester

## Program Outcomes

### Program Outcomes:

- Demonstrate critical thinking skills applicable to management of a technical business.
- Communicate clearly using business and management terminology.
- Apply human resource standards to manage in a professional environment.
- Value diversity in today's global business climate.
- Examine the consequences of failing to adhere to the concepts of inclusion in the global business climate.
- Use computer technology and software in a business environment.
- Apply ethical and professional behaviors to business.
- Demonstrate leadership skills needed to manage people and processes.
- Apply mathematical skills to interpret, understand, and communicate quantitative data.
- Evaluate the importance of world economic systems.
- Solve problems individually and in a team environment.
- Apply customer service and marketing skills in a business setting.
- Complete the process of identifying, gathering, measuring, summarizing, and analyzing financial data.
- Evaluate the importance of synergy in management.

## Degree Requirements

### Degree Requirements

Admitted students to Business Management & Leadership (AMGT) can transfer up to 40 technical and 20 Arts & Sciences credits. A transfer

evaluation is required. Not all credits may transfer into the degree program.

Code	Title	Credits
<b>Transfer Credits</b>		60
<b>General Requirements</b>		
MATH3000	Intermediate Statistics	2
WRIT4001	Capstone Writing	3
Upper Communications		2
Upper Humanities		2
Upper Social Sciences		2
<b>Technical Requirements</b>		
MGMT3141	Research for Business	4
MGMT3230	Strategic Planning	2
MGMT3211	Project Management	2
MGMT3110	Principles of Management	2
MGMT3130	Managerial Accounting	2
MGMT4230	Management Information Systems I	2
MGMT4110	Leadership	2
MGMT4120	Leading Organizational Change	2
MGMT4210	Capstone Research	4
MGMT3220	HR/Employment Law	2
MGMT4130	Entrepreneurial/Marketing Management	2
MGMT4140	Managerial Economics	2
MGMT4220	Negotiation & Conflict Resolution	2
MGMT4240	Applied Management Capstone	4
MGMT3120	Quality Systems	2
AMGT4220	Negotiation & Conflict Resolution Prac	2
AMGT4110	Human Resources Practicum	3
AMGT3230	Strategic Planning Practicum	2
AMGT3211	Project Management Practicum	2
AMGT4112	Leadership Practicum	2
AMGT4120	Leading Organizational Change Practicum	2
Total Credits		120

## Concentration Requirements

The four classes below replace AMGT3230, AMGT3211, AMGT4112 and AMGT4120 to form the MIS concentration for the Applied Management degree.

Code	Title	Credits
MISB3211	Systems Analysis Practicum	2
MISB3221	Database Technologies	2
MISB4111	Management of Distributed Systems	2
MISB4211	Management Information Systems II	2
Total Credits		8

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what

transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MGMT3141	Research for Business	4
MGMT3230	Strategic Planning	2
MGMT3211	Project Management	2
MGMT3110	Principles of Management	2
MGMT3130	Managerial Accounting	2
MGMT4230	Management Information Systems I	2
Upper Communications		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
MGMT4110	Leadership	2
MGMT4120	Leading Organizational Change	2
AMGT3230	Strategic Planning Practicum	2
AMGT3211	Project Management Practicum	2
MATH3000	Intermediate Statistics	2
WRIT4001	Capstone Writing	3
Credits		13
Total Credits		13

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
MGMT4210	Capstone Research	4
MGMT3220	HR/Employment Law	2
MGMT4130	Entrepreneurial/Marketing Management	2
MGMT4140	Managerial Economics	2
MGMT4220	Negotiation & Conflict Resolution	2
AMGT4112	Leadership Practicum	2
AMGT4120	Leading Organizational Change Practicum	2
Credits		16
Total Credits		16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
MGMT4240	Applied Management Capstone	4
MGMT3120	Quality Systems	2
AMGT4220	Negotiation & Conflict Resolution Prac	2
AMGT4110	Human Resources Practicum	3
Upper Humanities		2
Upper Social Sciences		2
Credits		15
Total Credits		15



## Courses

### Course Descriptions

#### **MGMT3141 | Research for Business | Lecture (4 Credits)**

Introduction to the basics of research design, and the quantitative and qualitative methods used in addressing policy-relevant research questions. The course has two major goals: 1) Enhance passive literacy of quantitative and qualitative research methods; 2) Develop active skills and apply techniques to original policy studies.

#### **MGMT3230 | Strategic Planning | Lecture (2 Credits)**

Examine the strategy of the business unit and analyze the issues central to a firm's short and long term competitive success. Investigate various models and approaches to designing and conducting strategic planning.

#### **MGMT3211 | Project Management | Lecture (2 Credits)**

Examine management concepts through the lens of the project life cycle. Identify various techniques of work planning, control and evaluation used to achieve project objectives.

#### **MGMT3110 | Principles of Management | Lecture (2 Credits)**

The contemporary supervision and operations management challenges stemming from changing organizational structures, complex environmental conditions, new technological developments, and increasingly diverse work forces. Focuses on critical issues in supervising, managing, and leading in an organization.

#### **MGMT3130 | Managerial Accounting | Lecture (2 Credits)**

Introduction of the fundamentals of managerial accounting for reporting, decision making and control of transactions, financial statements, strategic and operational planning to facilitate ethical behavior of the managerial accountant.

#### **MGMT4230 | Management Information Systems I | Lecture (2 Credits)**

The ways in which management and information services influence business strategies, communications technology, information systems analysis and design; issues arising out of the rapidly evolving field of information systems, and a general overview of IT compliance.

#### **MGMT4110 | Leadership | Lecture (2 Credits)**

Multidimensional study of leadership related to contemporary issues, privileges and responsibilities through an exploration of historical leaders, leadership styles and philosophies to recognize the traits, skills and values of a leader.

#### **MGMT4120 | Leading Organizational Change | Lecture (2 Credits)**

Examine the competencies and skills required to successfully lead organizational and personal change in the business world.

#### **MGMT4210 | Capstone Research | Capstone (4 Credits)**

The research portion of an industry(field)-specific capstone project of student's choice; present a comprehensive project within a field of study, that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT3110, MGMT3120, MGMT3130, MGMT3220, MGMT4130, And WRIT4001

#### **MGMT3220 | HR/Employment Law | Lecture (2 Credits)**

Analyze the role of the human resource professional as a strategic partner in managing today's organizations. Examine key functions such as recruitment, selection, development, appraisal, retention, compensation, and labor relations. Workplace safety, employment laws, legal rights and responsibilities are incorporated.

#### **MGMT4130 | Entrepreneurial/Marketing Management | Lecture (2 Credits)**

Entrepreneurial and marketing management fundamentals of planning, strategy, management and issues using skills and competencies needed to generate new ideas to develop a successful business.

#### **MGMT4140 | Managerial Economics | Lecture (2 Credits)**

Apply managerial economic decision making in the areas of mathematics, statistics, economic theory, accounting, finance, marketing, and human behavior.

#### **MGMT4220 | Negotiation & Conflict Resolution | Lecture (2 Credits)**

Strategies and tactics for conflict analysis, assessment and negotiation using exercises and simulations to successfully manage negotiations and conflict.

#### **MGMT4240 | Applied Management Capstone | Capstone (4 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

#### **MGMT3120 | Quality Systems | Lecture (2 Credits)**

Basic quality concepts, including the concepts of Total Quality Management (TQM), ISO9000, and LEAN/Six-Sigma concepts.

#### **AMGT4220 | Negotiation & Conflict Resolution Prac | Practicum (2 Credits)**

Apply negotiation and conflict resolution methodology through the use of hands on case studies and projects. Strategies and tactics for conflict analysis, assessment and negotiation created and monitored by students.

**Prerequisite(s):** MGMT4220

#### **AMGT4110 | Human Resources Practicum | Practicum (3 Credits)**

Carry out an in-depth investigation of a variety of Human Resources topics. The course will be project based; each student will identify an HR project relevant to his/her chosen field of study.

**Prerequisite(s):** MGMT3220

#### **AMGT3230 | Strategic Planning Practicum | Practicum (2 Credits)**

Apply strategic planning management methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT3230

#### **AMGT3211 | Project Management Practicum | Practicum (2 Credits)**

Apply project management methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT3211

#### **AMGT4112 | Leadership Practicum | Practicum (2 Credits)**

Application of leadership theory and methodology through the use of a case study and project for the purpose of integrating information and skills learned in previous program courses.

**Prerequisite(s):** MGMT4110

#### **AMGT4120 | Leading Organizational Change Practicum | Practicum (2 Credits)**

Apply organizational change theory and methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT4120

#### **MATH3000 | Intermediate Statistics | Lecture (2 Credits)**

Descriptive statistics, frequency distribution, normal probability functions and sampling distributions, estimation of population parameters, tests of statistical hypotheses and inference, t, F, chi-square, correlation, regression analysis and analysis of variance.

**General Education:** Upper Mathematics

**WRIT4001 | Capstone Writing | Lecture (3 Credits)**

Examine the essentials of writing clearly and efficiently within the framework of argumentative research writing. Formulate a coherent thesis and defend it logically with evidence drawn from research. Practice working through the stages of planning, research, organizing, and revising writing.

**General Education:** Upper Communications

**MISB3211 | Systems Analysis Practicum | Practicum (2 Credits)**

Survey of the various approaches for software development from traditional systems analysis to contemporary agile methods, UML and object-oriented design. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

**MISB3221 | Database Technologies | Practicum (2 Credits)**

Database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

**MISB4111 | Management of Distributed Systems | Practicum (2 Credits)**

Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

**MISB4211 | Management Information Systems II | Practicum (2 Credits)**

Examine budgeting, how to write RFP's (Request for Proposal), contract management, capacity planning, operations and user support, orphan ware, writing and enforcing policies. Identify aspects of security in software programs, social engineering, and network security.

## Arts & Sciences Department

Arts & Sciences helps students acquire the critical thinking, creative problem solving, and communications skills required by the modern workplace as well as provide them with the foundational knowledge they need to succeed in their technical coursework. The department offers courses in four different content areas: Communications; Natural Sciences/Mathematics; Arts/Humanities; and Social Science. Courses from the Arts & Sciences Department are integrated into students' academic plans based on their technical program of study and are taught by instructors with academic expertise in their subject areas. Arts & Sciences classes help put students on the fast track to success in their careers and lives by providing a well-rounded education that helps them develop broad thinking skills, an appreciation for life-long learning; professional oral and written communication skills, and a better understanding of the world around them.

## Program Outcomes

**Program Outcomes:**

- Analyze natural phenomena by using math and science principles.
- Interpret solutions supported by reason and evidence.
- Solve math and science problems using formulas and equations.
- Apply professional communication skills.
- Apply research and problem solving skills.
- Analyze written and oral material.
- Analyze artistic expression.
- Interpret the human condition through the arts.
- Interpret value systems as they relate to a particular culture.

- Apply scientific interpretations to explain human behavior.
- Interpret culture throughout history.
- Interpret societal roles.
- Analyze cultural and socioeconomic conditions.
- Analyze ways of life in our diverse society.
- Explain cultural differences.
- Relate inclusion to contemporary issues.

## General Education Communications

- WRIT2010 can also fulfill Communications with Writing category requirement on Academic Plan.

Code	Title	Credits
COMM1010	Business Communication	3
COMM1030	Project Communication	3
COMM1150	Interpersonal Communication	3
COMM1910	Communication Topics I	1
COMM1920	Communication Topics II	2
COMM2000	Communication for Technical Professions	5
ENGL1010	English	3
SPCH1000	Speech	3
WRIT2010	Technical Writing	3

## Diversity

- HUMN2400 course can also fulfill the Humanities requirements on Academic Plan. SBSC1000 and SOC2510 courses can also fulfill Social Sciences requirements on Academic Plan.

Code	Title	Credits
HUMN2400	Ethics	2
SBSC1000	Cultural Diversity	2
SOC2510	Global Studies	2

## Humanities

Code	Title	Credits
ARTS1000	Introduction to Drawing	3
ARTS1250	History of Design	3
ARTS1350	Structural Drawing	3
HUMN1910	Humanities Topics I	1
HUMN1920	Humanities Topics II	2
HUMN2100	The Literature of Migration	3
PHIL1000	Introduction to Logic	2
PHIL2000	Introduction to Philosophy	3

## Mathematics

- All mathematics courses can also fulfill the Natural Sciences/Mathematics requirements on Academic Plan.

Code	Title	Credits
MATH1000	Algebra & Trigonometry	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1110	Introductory College Algebra	2

MATH1200	Machine Math	3
MATH1250	Boolean Algebra	3
MATH1300	Boolean Algebra & Number Systems	2
MATH1350	Concepts of Calculus	3
MATH1500	Algebra, Trig & Boolean Algebra	5
MATH1700	Pre Calculus	3
MATH1810	Calculus I	3
MATH1811	Calculus I	4
MATH1820	Calculus II	3
MATH1821	Calculus II	4
MATH1910	Mathematics Topics I	1
MATH1920	Math Special Topics II	2
MATH2250	Statistics	3
MATH2260	Probability & Statistics	4
MATH2810	Multi-Variable Calculus	4
MATH2820	Linear Algebra & Differential Equations	4

## Natural Sciences

- All natural sciences courses can also fulfill the Natural Sciences/Mathematics requirements on Academic Plan.

Code	Title	Credits
BIOL1230	Anatomy	4
BIOL1310	Physiology I	2
BIOL1320	Physiology II	2
BIOL1400	Human Disease	4
CHEM2000	Introduction to Chemistry	3
GSCI1080	Environmental Science	3
GSCI1090	Current Events in Science	3
GSCI1095	How Science Explores the Natural World	3
GSCI1200	General Science	2
GSCI1910	General Science Topics I	1
GSCI1920	General Science Topics II	2
PHYS1000	Physics	3
PHYS1001	The Physics of Newton's Laws	2
PHYS1810	Calculus-Based Physics	3

## Physical Science with Lab

- All Physical Science with Lab courses can also fulfill the Natural Sciences and Natural Sciences/Mathematics requirements on Academic Plan. GSCI3000 course can also fulfill the Upper Physical Science with Lab requirements on Academic Plan.

Code	Title	Credits
CHEM2110	Chemistry with Lab	4
GSCI1081	Environmental Science with Lab	3
GSCI3000	Applied Environmental Science with Lab	3
PHYS1010	Physics with Lab	3
PHYS1800	Physics I with Lab	4
PHYS1820	Physics II with Lab	4

## Social Sciences

- PSYC1000 course can also fulfill the Psychology requirements on Academic Plan. SBSC1200 and SBSC2000 courses can also fulfill the Diversity requirements on Academic Plan.

Code	Title	Credits
ECON1000	Introduction to Micro & Macro Economics	3
GEOG1000	World Geography	3
PSYC1000	Psychology	3
SBSC1200	World Views & Religions	3
SBSC2000	Religion & Conflict	3
SOC1910	Social Sciences Topics I	1
SOC1920	Social Science Topics II	2
SOC2400	Sociology of Positive Interactions	3

## Upper Communications

Code	Title	Credits
COMM3000	Professional Communication	2
COMM3300	Mass Media & Popular Culture	2
RSCH4000	Research Methods	3
WRIT4001	Capstone Writing	3
WRIT4020	Capstone Technical Writing	2

## Upper Humanities

Code	Title	Credits
HUMN3000	Human Creative Expression	2
HUMN3600	Critical & Creative Thinking	3
HUMN3910	Arts & Humn Topics I	1
HUMN4000	Ethical Decision-Making	2

## Upper Mathematics

Code	Title	Credits
MATH3000	Intermediate Statistics	2

## Upper Social Sciences

- Please note that PSYC3000 course can also fulfill the Upper Psychology requirements on Academic Plan.

Code	Title	Credits
PSYC3000	Organizational Behavior	2
PSYC3100	Psychology of Group Dynamics	3
SOC3100	Workforce Diversity Issues	3
SOC3910	Social Behavioral Sciences Topics 1	1

## Automotive Department

- Automotive Collision Repair & Refinishing (COLL), AAS (p. 15)
- Automotive Service Technology (AUTO), AAS (p. 17)
- Honda Professional Auto Career Training (PACT), AAS (p. 19)
- Mopar Career Automotive Program (MCAP), AAS (p. 21)
- Toyota Technician Training & Education Network (TTEN), AAS (p. 24)

# Automotive Collision Repair & Refinishing (COLL), AAS

The Automotive Collision Repair & Refinishing program prepares graduates for employment in the collision repair and refinishing industry. Students receive classroom and hands-on training in vehicle repair procedures and techniques. Students learn to use specialized tools, materials, and techniques to straighten or replace damaged body panels and structural components as well as perform related mechanical and electrical repairs, restraint system repairs, and stationary glass replacement. Students also learn the latest procedures for partial and complete refinishing of an automobile as well as custom painting techniques. Arts & Sciences curriculum supports the technical skills students learn and enhances oral and written communication skills, fundamental math skills, and critical thinking ability.

In addition to the regular technical and Arts & Sciences courses, students complete two summer experiences. The first summer features a production course at the College that focuses on customer vehicle work in the Collision Repair & Refinishing lab. The second summer features either an internship at an approved collision repair facility or another production course on site at the College.

Dunwoody's programs utilize Inter-Industry Conference on Auto Collision Repair (I-CAR) training materials, and the program is an I-CAR Training Alliance Member. Instructors are certified as master technicians by the National Institute for Automotive Service Excellence (ASE) and are I-CAR Gold Class professionals.

The Automotive Service Excellence (ASE) Education Foundation has accredited Dunwoody's Automotive Collision Repair & Refinishing Program in Master Automotive Collision Repair and Refinishing—the highest level of achievement recognized by the ASE Education Foundation.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters + 2 summer sessions)

**Classes Offered:** Day

**Available Starts:** Fall Semester

**Accreditation:** ASE Education Foundation

**Bachelor's Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Analyze and report costs of collision repairs.
- Repair nonstructural damage to vehicles.
- Repair structural damage to vehicles.
- Repair mechanical and electrical components.
- Perform painting and refinishing repairs.
- Demonstrate effective customer satisfaction techniques.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
Communications		3
Humanities		3

Natural Science/Mathematics	2
Social Sciences	3
General Electives	9

### Technical Requirements

ABDY1111	Introduction to Auto Body	1
ABDY1120	Panel Replacement I: Bolt on Panels	2
ABDY1130	Panel Straightening & Paint Prep	3
ABDY1140	Auto Body Welding	3
ABDY1150	Plastic Repairs	1
ABDY1210	Brake & Suspension Repairs	2
ABDY1220	Intro to Refinishing Metals & Plastics	3
ABDY1230	Automotive Refinishing & Detailing	5
ABDY1311	Damage Analysis & Estimating	1
ABDY1320	Summer Production Repair Lab I	4
ABDY2110	Aluminum Welding & Complex Panel Repair	3
ABDY2120	Electrical, A/C Repairs & Hybrid Safety	3
ABDY2130	Restraint Systems & Stationary Glass	3
ABDY2140	Finish Matching & Plastic Refinishing	2
ABDY2210	Panel Replacement II: Welded Panels	2
ABDY2222	Structural Analysis, Measuring & Repair	6
ABDY2231	Custom Painting	1
<b>Technical Elective (Choose one course):</b>		4
ABDY2310	Production II Internship	
ABDY2320	Summer Production Repair Lab II	

Total Credits	69
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## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ABDY1111	Introduction to Auto Body	1
ABDY1120	Panel Replacement I: Bolt on Panels	2
ABDY1130	Panel Straightening & Paint Prep	3
ABDY1140	Auto Body Welding	3
ABDY1150	Plastic Repairs	1
Natural Science/Mathematics		2
Credits		12
Total Credits		12

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ABDY1210	Brake & Suspension Repairs	2
ABDY1220	Intro to Refinishing Metals & Plastics	3
ABDY1230	Automotive Refinishing & Detailing	5
Communications		3



General Electives		3
	Credits	16
	Total Credits	16
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>First Year</b>		
<b>Summer</b>		
ABDY1311	Damage Analysis & Estimating	1
ABDY1320	Summer Production Repair Lab I	4
	Credits	5
	Total Credits	5
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Fall</b>		
ABDY2110	Aluminum Welding & Complex Panel Repair	3
ABDY2120	Electrical, A/C Repairs & Hybrid Safety	3
ABDY2130	Restraint Systems & Stationary Glass	3
ABDY2140	Finish Matching & Plastic Refinishing	2
Social Sciences		3
General Electives		3
	Credits	17
	Total Credits	17
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
ABDY2210	Panel Replacement II: Welded Panels	2
ABDY2222	Structural Analysis, Measuring & Repair	6
ABDY2231	Custom Painting	1
Humanities		3
General Electives		3
	Credits	15
	Total Credits	15
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Summer</b>		
ABDY2320 or ABDY2310	Summer Production Repair Lab II or Production II Internship	4
	Credits	4
	Total Credits	4

## Courses

### Course Descriptions

#### ABDY1111 | Introduction to Auto Body | Lec/Lab (1 Credit)

Overview of the past, present, and future of the collision industry with emphasis on safety, equipment, tools, and body shop operations. Industry expectations and career opportunities are explored.

#### ABDY1120 | Panel Replacement I: Bolt on Panels | Lec/Lab (2 Credits)

Identify, remove, and install all vehicle panels requiring bolt on application. Practice alignment techniques, acceptable fasteners, and industry approved methods.

**Prerequisite(s):** ABDY1111

#### ABDY1130 | Panel Straightening & Paint Prep | Lec/Lab (3 Credits)

Examine and practice industry acceptable methods of metal straightening, plastic filler application, primer surfacers, and sanding techniques. Prepare OEM finishes for refinishing on metal and plastic panels.

**Prerequisite(s):** ABDY1120

#### ABDY1140 | Auto Body Welding | Lec/Lab (3 Credits)

Relate safety, equipment, and welding techniques to collision repair. Special consideration to I-CAR welding procedures and tests.

**Prerequisite(s):** ABDY1130

#### ABDY1150 | Plastic Repairs | Lec/Lab (1 Credit)

Identify and practice techniques associated with welding, bonding, and cosmetic repair of automotive plastics. Prepare interior plastic for refinishing and re-texturing.

**Prerequisite(s):** ABDY1140

#### ABDY1210 | Brake & Suspension Repairs | Lec/Lab (2 Credits)

Examine automotive brakes and suspensions, ABS and traction control systems, alignments, and steering for collision related damage.

**Prerequisite(s):** ABDY1120

#### ABDY1220 | Intro to Refinishing Metals & Plastics | Lec/Lab (3 Credits)

Identify refinishing safety issues, environmental concerns, water-based paint and solvent based paint procedures; practice correct procedures on metals and plastics as related to collision repair.

**Prerequisite(s):** ABDY1150

#### ABDY1230 | Automotive Refinishing & Detailing | Lec/Lab (5 Credits)

Practice refinishing of automotive collision repairs, and vehicle masking techniques; identify paint problems and corrections.

**Prerequisite(s):** ABDY1220

#### ABDY1311 | Damage Analysis & Estimating | Lec/Lab (1 Credit)

Practice in collision damage appraisal using industry accepted software and computerized estimating programs to prepare collision damage reports or estimates.

**Prerequisite(s):** ABDY1230

#### ABDY1320 | Summer Production Repair Lab I | Laboratory (4 Credits)

Practice the skills learned in the first year of coursework using customer vehicles.

**Prerequisite(s):** ABDY1311

#### ABDY2110 | Aluminum Welding & Complex Panel Repair | Lec/Lab (3 Credits)

Properties of aluminum, aluminum alloys, welding processes and materials utilized for aluminum welding. Setup and adjustment of the MIG welder for aluminum, weld joint preparation, aluminum welding procedures and safety precautions. Welding on aluminum adhering to I-CAR Aluminum welding standards and testing methods. Body panel damage assessment. Repair of steel and aluminum body panels with complex shapes and damage to style lines and attached inner panels. Procedures and products used to restore corrosion protection to repaired panels.

**Prerequisite(s):** ABDY1130 And ABDY1140

#### ABDY2120 | Electrical, A/C Repairs & Hybrid Safety | Lec/Lab (3 Credits)

Fundamentals of electricity and related automotive circuits, tracing of vehicle wiring diagrams and repair of collision related malfunctions of electrical components and wiring. Identification and usage of electrical test tools and head lamp aiming. Air conditioning theory of operation, properties of refrigerants, and safety procedures. Set up and use of air conditioning service equipment. Refrigerant reclaiming, recycling, evacuation and recharging. Diagnostic procedures for troubleshooting air conditioning systems. Safety precautions and disabling procedures for working on and around hybrid vehicle electrical systems.

**Prerequisite(s):** ABDY1320

**ABDY2130 | Restraint Systems & Stationary Glass | Lec/Lab (3 Credits)**

The development of restraint systems. Air bag theory of operation, function of components and wiring, deployment conditions, safety precautions, and inspection procedures for restraint systems. Practice of service procedures for air bag and seat belt systems. The role that glass plays in a modern vehicle. Procedures for replacement of structural glass and for correction of wind noises and water leaks. Removal and re-installation of interior trim.

**Prerequisite(s):** ABDY2120

**ABDY2140 | Finish Matching & Plastic Refinishing | Lec/Lab (2 Credits)**

Collision industry procedures used for color matching, tinting and blending. Color theory, panel preparation and practical application of urethane (solvent based) and waterborne automotive paint products utilizing color mixing systems. Procedures, techniques, and materials used in tri-coat (three stage) finish repairs. Specialized products and procedures used to refinish automotive plastics. Identification and refinishing of flexible plastic panels.

**Prerequisite(s):** ABDY1230

**ABDY2210 | Panel Replacement II: Welded Panels | Lec/Lab (2 Credits)**

Identification, removal and installation of welded and adhesively bonded automotive body panels. Identification and use of a squeeze type resistance spot welder and other specialized panel removal tools and welding equipment. Practice restoring corrosion protection to replaced panels using primers and anti-corrosion compounds. Identification of and proper application of automotive body seam sealers.

**Prerequisite(s):** ABDY1120 And ABDY2110

**ABDY2222 | Structural Analysis, Measuring & Repair | Lec/Lab (6 Credits)**

Vehicle collision damage analysis, inspection techniques, damage classification and types of vehicle construction. Measuring concepts, set-up and use of measuring systems, vehicle anchoring systems and structural straightening equipment. Industry (I-CAR) guidelines for structural repairs including frame and unibody straightening, structural component replacement, sectioning and restoring corrosion protection. Disassemble vehicles for repairs, develop a vehicle repair plan, perform structural repairs, including repairs to mechanical and electrical systems as well as replacement of structural glass.

**Prerequisite(s):** ABDY2210

**ABDY2231 | Custom Painting | Lec/Lab (1 Credit)**

Surface preparation procedures, specialized refinish materials, spray equipment and techniques used for custom painting on vehicle panels or small projects. Materials utilized include standard urethane (solvent-based) base coats, waterborne base coats, candy colors, pearls, and metal flakes. Masking and design transfer techniques for custom painting.

**Prerequisite(s):** ABDY2140

**ABDY2310 | Production II Internship | Internship (4 Credits)**

This Internship is offered for qualified students who are interested in fulfilling their 2nd year production requirement for the Collision Program via a 216 hour internship rather than participating in ABDY 2320 Production Lab II. Must be able to secure an internship at a collision repair facility and have the approval of the Collision program faculty. A formal agreement will be developed between the student, the employer, and an advisor assigned by Dunwoody. Internship must be approved by the Department Director of Internship Advisor.

**Prerequisite(s):** ABDY2222 And ABDY2210

**ABDY2320 | Summer Production Repair Lab II | Laboratory (4 Credits)**

Perform major and minor collision repairs; repair or replace structural members and exterior panels; remove and replace glass and upholstery; suspension and mechanical components; prepare panels for paint; refinish panels or vehicles as necessary. Create computerized repair estimates, discuss repairs with customers, order parts and assist in completion of repair orders for customer billing.

**Prerequisite(s):** ABDY2210 And ABDY2222

## Automotive Service Technology (AUTO), AAS

The Automotive Service Technology program prepares graduates for a career as a technician in automotive dealerships as well as in fleet, franchised, and independent repair facilities. The program combines classroom, lab, and, in some cases, internship experience in all aspects of automotive diagnosis and repair. Students use hands-on, applied learning with high-tech tools and systems to acquire knowledge and skills which foster the ability to continuously adapt to an ever-changing technology.

Arts & Sciences curriculum supports the technical skills students learn as well as enhances students' oral and written communication skills and critical thinking ability. All instructors are National Institute for Automotive Service Excellence (ASE) certified technicians.

The Automotive Service Excellence (ASE) Education Foundation has accredited Dunwoody's Automotive Service Technology program in Master Automobile Service Technology - the highest level of achievement recognized by the ASE Education Foundation.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** NATEF

**Bachelor's Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Identify and describe automobile components.
- Explain automotive systems' operations.
- Disassemble and assemble components.
- Diagnose vehicle conditions.
- Evaluate component condition and recommend action.
- Repair conditions and verify operation.
- Demonstrate effective customer satisfaction techniques.
- Demonstrate effective shop management techniques.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
	Communications	3
	Humanities	3
	Natural Sciences/Mathematics	2
	Social Sciences	3

General Electives	9
<b>Technical Requirements</b>	
AUTO1110 General Skills & Engine Fundamentals	3
AUTO1120 Brakes, Steering & Suspensions	4
AUTO1130 Electrical & Electronic Principles	7
AUTO1210 Engine Repair	3
AUTO1220 Automatic Transmissions	3
AUTO1230 Accessories, Heating & Air Conditioning	6
AUTO2110 Engine Performance	13
AUTO2210 Drivetrain	3
<b>Technical Elective (Choose one course):</b>	<b>8</b>
AUTO2220 Production	
AUTO2230 Auto Internship	
Total Credits	70

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
Natural Sciences/Mathematics		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
AUTO1210	Engine Repair	3
AUTO1220	Automatic Transmissions	3
AUTO1230	Accessories, Heating & Air Conditioning	6
Communications		3
General Electives		3
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
AUTO2110	Engine Performance	13
Social Sciences		3
General Electives		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
AUTO2210	Drivetrain	3
AUTO2220 or AUTO2230	Production or Auto Internship	8
Humanities		3
General Electives		3
Credits		17
Total Credits		17

## Courses

### Course Descriptions

#### AUTO1110 | General Skills & Engine Fundamentals | Lec/Lab (3 Credits)

Use tools and measuring instruments. Identify fasteners and fittings, remove damaged fasteners, fabricate brake lines. Research service procedures using automotive information systems. Disassemble and assemble component engines. Describe engine parts, systems, and operation.

#### AUTO1120 | Brakes, Steering & Suspensions | Lec/Lab (4 Credits)

Examine theory of design and principles of operation, diagnosis and repair procedures of automotive brake, steering and suspension systems. Practice performing service procedures, four-wheel alignments, tire and wheel service.

#### AUTO1130 | Electrical & Electronic Principles | Lec/Lab (7 Credits)

Examine theory and principles of: Ohm's law, circuit principles, magnetism, electromagnetism, batteries, induction, cranking motors, charging systems, basic electronics including semiconductors. Use digital multimeters and wiring schematics to trace, test, and diagnose circuits. Disassemble, inspect, test, and reassemble starters and alternators. On-vehicle diagnosis of battery, starting, and charging systems.

#### AUTO1210 | Engine Repair | Lec/Lab (3 Credits)

Examine design and operating principles of engine systems. Disassemble, inspect, measure, and reassemble a complete running engine validated by proper operation when work is completed.

**Prerequisite(s):** AUTO1110 And AUTO1130

#### AUTO1220 | Automatic Transmissions | Lec/Lab (3 Credits)

Fundamentals of planetary gears, theory of operation of components and controls. Disassemble, inspect, and reassemble component automatic transmissions and transaxles. Practice maintenance and general testing procedures, pressure testing, electronic scan tool testing. Effective use of service information is emphasized.

**Prerequisite(s):** AUTO1120 And AUTO1130

#### AUTO1230 | Accessories, Heating & Air Conditioning | Lec/Lab (6 Credits)

Wiring circuit interpretation, accessory operation, lighting system design, circuit tracing, and service procedures. Diagnose and repair lighting, instrumentation, accessories, and air-bags. Heating/air conditioning component operation and physics. Control system diagnosis, service, repair procedures, and pressure diagnosis. On vehicle procedures for recovery/recycling equipment.

**Prerequisite(s):** AUTO1130

**AUTO2110 | Engine Performance | Lec/Lab (13 Credits)**

Analysis of the theory of operation, design, diagnosis, and repair procedures of engine control and computer systems. Examine emerging engine performance and vehicle propulsion technologies. Use standard and computerized tune-up test equipment to make a complete performance analysis and/or diagnosis of specific problems to determine the work needed on vehicles. Repairs are made to restore the vehicle's performance, emissions, and fuel economy to as near as possible to original factory and EPA standards.

**Prerequisite(s):** AUTO1230

**AUTO2210 | Drivetrain | Lec/Lab (3 Credits)**

Theory of operation, inspection, diagnosis, disassembly and reassembly of transmissions, transaxles and transfer cases. Design, principles of operation, diagnosis, troubleshooting and repair procedures for drive axles, drive shafts, universal joints, differentials and clutches. Oxyacetylene torch procedures.

**Prerequisite(s):** AUTO1210, AUTO1220, And AUTO1230

**AUTO2220 | Production | Lec/Lab (8 Credits)**

Practical shop experience in all aspects of automotive repair on customer's vehicle. Fundamentals of shop management, repair order writing, parts procurement, and customer relations. Principles of NVH (noise, vibration, and harshness) diagnosis, and advanced chassis control systems.

**Prerequisite(s):** AUTO1230, AUTO1220, And AUTO1210

**AUTO2230 | Auto Internship | Internship (8 Credits)**

Supervised training in repairing various problems with customer vehicles while working at an automotive repair facility. Need department director approval; must follow approved guidelines listed in the internship packet. This course can be taken in lieu of AUTO2220 Production.

**Prerequisite(s):** AUTO1210, AUTO1220, And AUTO1230

## Honda Professional Auto Career Training (PACT), AAS

The Honda PACT program prepares graduates to be technicians servicing Honda and Acura vehicles at authorized dealerships. Students train specifically on current model Honda and Acura vehicles, information systems, scan tools, and training materials. Students also complete an internship under the guidance of a master technician at a sponsoring American Honda or Acura dealership. These paid internships give students the opportunity to integrate their learning and further develop their skills in service technology. Arts & Sciences curriculum supports the technical skills students learn as well as enhances students' oral and written communication skills and critical thinking ability.

All Honda PACT instructors are certified by Honda in the areas that they teach, in addition to being certified as Master Technicians by the National Institute for Automotive Service Excellence (ASE).

Dunwoody's Honda PACT program has received several awards from American Honda for being one of the best Honda PACT automotive schools in the nation.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** Honda PACT Certification

**Bachelor's Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Identify and describe automobile components.
- Explain automotive systems' operations.
- Disassemble and assemble components.
- Diagnose vehicle conditions.
- Repair conditions and verify operation.
- Demonstrate effective customer satisfaction techniques.
- Evaluate component condition and recommend action.
- Demonstrate effective shop management techniques.

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
Communications		3
Humanities		3
Natural Science/Mathematics		2
Social Sciences		3
General Electives		9
<b>Technical Requirements</b>		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
PACT1210	Dealer Service Systems	3
PACT1220	Body Electrical Systems	4
PACT1230	Advanced Brakes & Suspension Systems	3
PACT2110	Drivetrain Systems	7
PACT2120	Heating & Air Conditioning	2
PACT2131	PACT Internship I	4
PACT2210	Engine Diagnostics & Repair	3
PACT2220	Engine Performance Repair	6
PACT2231	PACT Internship II	4
Total Credits		70

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7



Natural Science/Mathematics		2
	Credits	16
	Total Credits	16
Course	Title	Credits
First Year		
Spring		
PACT1210	Dealer Service Systems	3
PACT1220	Body Electrical Systems	4
PACT1230	Advanced Brakes & Suspension Systems	3
Communications		3
General Electives		3
	Credits	16
	Total Credits	16
Course	Title	Credits
Second Year		
Fall		
PACT2110	Drivetrain Systems	7
PACT2120	Heating & Air Conditioning	2
PACT2131	PACT Internship 1	4
Social Sciences		3
General Electives		3
	Credits	19
	Total Credits	19
Course	Title	Credits
Second Year		
Spring		
PACT2210	Engine Diagnostics & Repair	3
PACT2220	Engine Performance Repair	6
PACT2231	PACT Internship II	4
Humanities		3
General Electives		3
	Credits	19
	Total Credits	19

## Courses

### Course Descriptions

#### AUTO1110 | General Skills & Engine Fundamentals | Lec/Lab (3 Credits)

Use tools and measuring instruments. Identify fasteners and fittings, remove damaged fasteners, fabricate brake lines. Research service procedures using automotive information systems. Disassemble and assemble component engines. Describe engine parts, systems, and operation.

#### AUTO1120 | Brakes, Steering & Suspensions | Lec/Lab (4 Credits)

Examine theory of design and principles of operation, diagnosis and repair procedures of automotive brake, steering and suspension systems. Practice performing service procedures, four-wheel alignments, tire and wheel service.

#### AUTO1130 | Electrical & Electronic Principles | Lec/Lab (7 Credits)

Examine theory and principles of: Ohm's law, circuit principles, magnetism, electromagnetism, batteries, induction, cranking motors, charging systems, basic electronics including semiconductors. Use digital multimeters and wiring schematics to trace, test, and diagnose circuits. Disassemble, inspect, test, and reassemble starters and alternators. On-vehicle diagnosis of battery, starting, and charging systems.

#### PACT1210 | Dealer Service Systems | Lec/Lab (3 Credits)

Introduction to dealership systems: repair order writing, dealership management training, and Honda Interactive Networking systems. Emphasis will be on vehicle inspection techniques; utilization of Honda scan tools in troubleshooting advanced computer controlled vehicles. **Prerequisite(s):** PACT1210

#### PACT1220 | Body Electrical Systems | Lec/Lab (4 Credits)

Theory of operation and diagnostic principles of Honda/Acura chassis and body electrical systems. On-vehicle component testing with the latest scan tools, digital multi-meters, lab scopes, and factory electrical schematics. **Prerequisite(s):** PACT1210

#### PACT1230 | Advanced Brakes & Suspension Systems | Lec/Lab (3 Credits)

Theory of operation and diagnostic principles of Honda/Acura brake/suspension systems. ABS (Anti-lock braking system), traction control systems, advanced steering stability systems, pre-alignment inspections. 4-wheel alignment, suspension & steering systems, component repair and replacement, troubleshooting vibration, noise, and harshness concerns. **Prerequisite(s):** PACT1210 And PACT1220

#### PACT2110 | Drivetrain Systems | Lec/Lab (7 Credits)

Theory of operation and diagnostic principles of Honda/Acura drivetrain systems. Differentials, CV and universal joints, manual transmissions, transfer cases, automatic transmissions. System maintenance, periodic service, and on-vehicle diagnosis. Disassembly, inspection, and assembly of system components. CVT transmission and hybrid transmission. **Prerequisite(s):** PACT1210, PACT1220, And PACT1230

#### PACT2120 | Heating & Air Conditioning | Lec/Lab (2 Credits)

Theory of operation and diagnostic principles of Honda/Acura air conditioning and heating systems. Refrigeration system service, control system repair, heater service, automatic heating/AC systems, component testing, environmental issues, and troubleshooting the various systems. **Prerequisite(s):** PACT1210, PACT1220, And PACT1230

#### PACT2131 | PACT Internship 1 | Internship (4 Credits)

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas. **Prerequisite(s):** PACT1210, PACT1220, And PACT1230

#### PACT2210 | Engine Diagnostics & Repair | Lec/Lab (3 Credits)

Hands-on repair of the Honda/Acura Engines. Service procedures include cooling system repair, lubrication system repair, intake systems repair, exhaust repair, engine testing, engine replacement, engine disassembly, cleaning and measurement, cylinder head diagnostics, timing belt/chain replacement 4cyl, 6cyl, 8cyl.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

#### PACT2220 | Engine Performance Repair | Lec/Lab (6 Credits)

Hands-on repair of the Honda/Acura fuel and computerized engine control systems. Service procedures include: fuel pressure testing, fuel injector testing, exhaust gas analysis, advanced scan tool usage, and on-vehicle diagnostics. Advanced diagnostics, including hands-on repair of the Honda/Acura engine control systems. Service procedures include: on-vehicle diagnostics of Honda/Acura including advanced computer control systems, networking communication, emission control systems, and test drive diagnostic techniques.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

#### PACT2231 | PACT Internship II | Internship (4 Credits)

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas. **Prerequisite(s):** PACT1210, PACT1220, And PACT1230

# Mopar Career Automotive Program (MCAP), AAS

MCAP is an internship-based Dunwoody College of Technology AAS Degree manufacturer program in partnership with FIAT Chrysler Automobiles (FCA). The program is designed to train students in all aspects of vehicle repair on Chrysler, Dodge, Jeep®, Ram, and FIAT vehicles, using a combination of FCA Performance Institute and Dunwoody College of Technology training materials.

MCAP students receive cutting-edge training in automotive systems such as computer controls, BUS communication, wireless communication, telematics, HVAC, diesel, and mechanical in addition to all nine ASE Automotive Skill categories including light duty diesel.

Students in their first semester will be trained in fundamental mechanical and electrical automotive systems. During the remaining semesters, students will be in MCAP-specific classes, while spending a portion of their time interning at a sponsoring Chrysler, Dodge, Jeep®, Ram, or FIAT dealer. A portion of every semester will also be spent fulfilling Arts & Sciences course requirements. Upon graduation, MCAP Students will be Level 2 Certified in all seven FCA Performance Institute Core Skill areas.

The Dunwoody MCAP instructor is a National Institute for Automotive Service Excellence (ASE) certified Master Technician with G1 & L1 Certification. He is also FCA certified in the areas taught. The Automotive Service Excellence (ASE) Education Foundation has accredited Dunwoody's MoparCAP in Master Automobile Service Technology—the highest level of achievement recognized by the ASE Education Foundation.

FCA has awarded Dunwoody its Outstanding Achievement Award for Innovative Ideas, illustrating the success of the longtime partnership between FCA and Dunwoody.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters + 1 summer session)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** ASE Education Foundation; Fiat Chrysler Automobiles (FCA) authorized Mopar Career Automotive Program

**Bachelor's Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Diagnose vehicle conditions.
- Identify and describe components and systems operations.
- Disassemble and assemble components.
- Evaluate component condition and recommend repair.
- Repair conditions and verify operations.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
Communications		3
Humanities		3

Natural Science/Mathematics		2
Social Sciences		3
General Electives		9
<b>Technical Requirements</b>		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
MCAP1001	Mopar Fundamentals	3
MCAP1005	Noise, Vibration & Harshness	1
MCAP1061	Mopar Electrical & Body Systems	2
MCAP1071	Mopar Climate Control	2
MCAP2510	MCAP Internship I	2
MCAP2520	MCAP Internship II	2
MCAP1081	Mopar Powertrain Performance	3
MCAP1091	Mopar Diesel Systems	1
MCAP2530	MCAP Internship III	2
MCAP1011	Mopar Engines	2
MCAP1021	Mopar Automatic Drivetrain	3
MCAP1031	Mopar Manual Drivetrain	2
MCAP1041	Mopar Steering & Suspension Systems	1
MCAP1051	Mopar Braking Systems	1
MCAP2540	MCAP Internship IV	2
MCAP2550	MCAP Internship V	2
MCAP2560	MCAP Internship VI	2
MCAP2570	MCAP Internship VII	3
Total Credits		70

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
Natural Science/Mathematics		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
MCAP1001	Mopar Fundamentals	3
MCAP1005	Noise, Vibration & Harshness	1
MCAP1061	Mopar Electrical & Body Systems	2
MCAP1071	Mopar Climate Control	2
MCAP2510	MCAP Internship I	2

MCAP2520	MCAP Internship II	2
Communications		3
	Credits	15
	Total Credits	15
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>First Year</b>		
<b>Summer</b>		
MCAP1081	Mopar Powertrain Performance	3
MCAP1091	Mopar Diesel Systems	1
MCAP2530	MCAP Internship III	2
General Electives		3
	Credits	9
	Total Credits	9
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Fall</b>		
MCAP1011	Mopar Engines	2
MCAP1021	Mopar Automatic Drivetrain	3
MCAP1031	Mopar Manual Drivetrain	2
MCAP1041	Mopar Steering & Suspension Systems	1
MCAP1051	Mopar Braking Systems	1
MCAP2540	MCAP Internship IV	2
MCAP2550	MCAP Internship V	2
Social Sciences		3
General Electives		3
	Credits	19
	Total Credits	19
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
MCAP2560	MCAP Internship VI	2
MCAP2570	MCAP Internship VII	3
Humanities		3
General Electives		3
	Credits	11
	Total Credits	11

## Courses

### Course Descriptions

#### AUTO1110 | General Skills & Engine Fundamentals | Lec/Lab (3 Credits)

Use tools and measuring instruments. Identify fasteners and fittings, remove damaged fasteners, fabricate brake lines. Research service procedures using automotive information systems. Disassemble and assemble component engines. Describe engine parts, systems, and operation.

#### AUTO1120 | Brakes, Steering & Suspensions | Lec/Lab (4 Credits)

Examine theory of design and principles of operation, diagnosis and repair procedures of automotive brake, steering and suspension systems. Practice performing service procedures, four-wheel alignments, tire and wheel service.

#### AUTO1130 | Electrical & Electronic Principles | Lec/Lab (7 Credits)

Examine theory and principles of: Ohm's law, circuit principles, magnetism, electromagnetism, batteries, induction, cranking motors, charging systems, basic electronics including semiconductors. Use digital multimeters and wiring schematics to trace, test, and diagnose circuits. Disassemble, inspect, test, and reassemble starters and alternators. On-vehicle diagnosis of battery, starting, and charging systems.

#### MCAP1001 | Mopar Fundamentals | Lec/Lab (3 Credits)

Identify the steps that should be performed for vehicle maintenance. Perform a vehicle inspection. Perform a step-by-step process to complete a New Vehicle Preparation service procedure. Practical usage of meters and lab scope operation to quickly and accurately perform electrical diagnosis. Identify the different types of sensors, control and load devices in vehicle electronic architectures. Identify modules that require programming after replacement and properly program a module after replacement. Identify operating characteristics and diagnose components of the various communication networks on vehicles.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

#### MCAP1005 | Noise, Vibration & Harshness | Lec/Lab (1 Credit)

Isolation of components, use of special tools, current problem resolution, and interpretation of system component frequencies. The six-step diagnostic approach is used along with the sirometer to demonstrate amplitude and frequency of a vibration. Identify terms necessary for diagnosing NVH concerns. Calculate NVH frequencies necessary for component classification. Identify test equipment and tools used in diagnosing and correcting NVH concerns.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

#### MCAP1061 | Mopar Electrical & Body Systems | Lec/Lab (2 Credits)

Perform the manufacturer recommended diagnostic and test procedures for vehicle electrical systems. Select, connect and interpret the results of the Lab scope readings. Locate and identify restraint system components. Decode the restraint systems information from the vehicle identification number (VIN). List all components requiring replacement or inspection after air bag deployment. Identify the cause of an illuminated airbag warning lamp. Identify and diagnose stored and active DTC's. Identify, locate, and diagnose items such as vehicle theft alarm, lighting, and power systems. Identify and use tools required to service interior and exterior trim component. Identify fasteners required to service interior and exterior body trim components. Diagnose major sources of wind noise and water leak issues. Remove and install a door module. Research proper operation of a sunroof system.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

#### MCAP1071 | Mopar Climate Control | Lec/Lab (2 Credits)

Examine the principles of heat transfer. Correlate refrigerant pressure and temperature along with their effects on the boiling point of water and refrigerant. Identify A/C components, electrical components and controls, in automotive air conditioning and heating systems. Use HVAC service procedures as well as A/C recovery and recycling equipment to repair HVAC concerns. Complete an EPA approved A/C recovery and recycling certification.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

#### MCAP2510 | MCAP Internship I | Internship (2 Credits)

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2520 | MCAP Internship II | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP1081 | Mopar Powertrain Performance | Lec/Lab (3 Credits)**

Examine the principles of the speed density and mass air flow fuel injection system including methods of determining air, fuel and spark requirements. Identify idle control, and principles of major input and output circuit operation along with the major subsystems operated by the Powertrain Control Module (PCM); locate and test power, grounds, and voltage sense circuits. Identify the different types of ignition systems along with the primary and secondary circuits. Identify the operation of the Up and Downstream O2 sensor, open and closed loop operation and their effect on fuel injector pulse width. Identify the operation of the catalytic converter and other emission controls such as EGR and EVAP systems. Diagnose vehicles with manufacturer test equipment. Explain how OBDII began, how it is currently implemented along with requirements and why they are necessary. Describe current emission control systems, diagnostic tools; diagnostic trouble codes, freeze frame data, and monitors.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1091 | Mopar Diesel Systems | Lec/Lab (1 Credit)**

Examine the principles, operation, and diagnosis of diesel engines. Identify the components and operation of diesel air induction systems. Test the components and operation of the various diesel fuel systems. Identify the components and operation of the diesel electronic control systems as well as the components and operation of the various diesel exhaust emissions and after-treatment systems. Perform various tests and diagnostic routines available with the Chrysler Diagnostic Scan tool.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP2530 | MCAP Internship III | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP1011 | Mopar Engines | Lec/Lab (2 Credits)**

Differentiate between Cam in Block and Cam in Head engines. Locate components and perform specific repair procedures. Use the manufacturer special tools developed for these engines. Inspect and service the timing system. Service upper engine components and adjustment procedures. Service lower engine components. Explain cooling system operation and coolant flow. Describe oil flow through the engine. Identify the characteristics of engine mechanical diagnosis, for the following areas of concern: engine assembly noises, cooling system problems, and oil loss. Perform selected engine mechanical diagnostic tests listed in the manufacturer service information and analyze test results to determine necessary repairs.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1021 | Mopar Automatic Drivetrain | Lec/Lab (3 Credits)**

Explain the purpose of automatic transmission fluid, the available fluid types, and the various ways of checking fluid level. Identify the laws of hydraulics and Pascal's law. Identify the purpose, operation, and construction of a torque converter, as well as the concepts of fluid coupling and torque multiplication. Identify the purpose, construction and operation internal gear train components, specifically planetary gear sets, clutch packs, and overrunning clutches. Explain transmission power flow, with regards to the operation of planetary gear sets to get reduction, second gear, direct drive, overdrive, and reverse. Identify purpose, construction and operation of transmission hydraulics & controls, specifically the oil pump and sump, valve body, and accumulators. Use manufacturer special tools to disassemble and reassemble automatic transmissions. Identify the purpose and operation of all transmission electrical direct input and output devices.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1031 | Mopar Manual Drivetrain | Lec/Lab (2 Credits)**

Disassemble, explain powerflow, and reassemble manual transmissions, transfer cases and differentials. Identify components by using the identification tag. Identify the purpose and operation of precision tools including feeler gauge set, micrometer, dial indicator, dial caliper, dial and beam style torque wrenches. Differentiate between front wheel drive and rear wheel drive transmission components. Compare the powerflow through a front wheel drive and a rear wheel drive manual transmission. Determine the lubrication requirements for the different types of manual driveline assemblies. Identify the electronic operation of the various manual driveline controls. Identify the various clutch types, components, and release components. Differentiate between 4WD and AWD systems.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1041 | Mopar Steering & Suspension Systems | Lec/Lab (1 Credit)**

Identify types, characteristics, and diagnostics of power steering systems. Perform power steering system pressure analysis. Identify test equipment and analyze tire pressure monitoring systems. Identify the various suspension types available for automotive applications. Explain the function of steering components as they relate to an automotive steering system.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1051 | Mopar Braking Systems | Lec/Lab (1 Credit)**

Identify the components and function of typical antilock brake systems (ABS). Identify and test the types of ABS control module inputs and outputs. Explain the procedure for bleeding brake fluid in an ABS. Use manufacturer special tools to diagnose electrical components related to the brake system. Differentiate among traction control, roll mitigation, electronic brake distribution, and electronic stability control.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP2540 | MCAP Internship IV | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, following the procedures outlined in the MCAP Internship manual, working under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2550 | MCAP Internship V | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, following the procedures outlined in the MCAP Internship manual, working under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130



**MCAP2560 | MCAP Internship VI | Internship (2 Credits)**  
Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.  
**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2570 | MCAP Internship VII | Internship (3 Credits)**  
Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.  
**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

# Toyota Technician Training & Education Network (TTEN), AAS

The Toyota T-TEN program prepares graduates to be technicians servicing Toyota and Lexus vehicles at authorized dealerships. Students train specifically on current model Toyota and Lexus vehicles, information systems, scan tools, and training materials. Students also complete an internship under the guidance of a master technician at a sponsoring Toyota or Lexus dealership. These paid internships give students the opportunity to integrate their learning and further develop their skills in service technology. Arts & Science curriculum supports the technical skills students learn as well as enhance students’ oral and written communication skills.

All T-TEN instructors are certified by Toyota in the areas that they teach, in addition to being certified as Master Technicians by the National Institute for Automotive Service Excellence (ASE).

Dunwoody has received recognition from Toyota for being one of the best T-TEN automotive schools in the nation and is a Chassis, Electrical, Engine, Drivability (CEED) School, the highest level for a T-TEN school.

**Credential Earned:** AAS  
**Length of Program:** 2 years (4 semesters)  
**Classes Offered:** Day  
**Available Starts:** Fall Semester; Spring Semester  
**Accreditation:** CEED (Chassis, Electrical, Engine, Drivability), Toyota’s Top Post-Secondary Level of Instruction  
**Bachelor’s Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Identify and describe automobile components.
- Explain automotive systems’ operations.
- Disassemble and assemble components.
- Diagnose vehicle conditions.
- Evaluate component condition and recommend action.
- Repair conditions and verify operation.
- Demonstrate effective customer satisfaction techniques.
- Demonstrate effective shop management techniques.

## Degree Requirements

Code	Title	Credits
General Requirements		
Communications		3
Humanities		3
Natural Science/Mathematics		2
Social Sciences		3
General Electives		9
Technical Requirements		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
TTEN1210	Dealer Service Systems	3
TTEN1220	Body Electrical Systems	4
TTEN1230	Advanced Brakes & Suspension Systems	3
TTEN2110	Drivetrain Systems	7
TTEN2120	Heating & Air Conditioning	2
TTEN2131	TTEN Internship I	4
TTEN2210	Engine Diagnostics & Repair	3
TTEN2220	Engine Performance Repair	6
TTEN2231	TTEN Internship II	4
Total Credits		70

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student’s schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
First Year		
Fall		
AUTO1110	General Skills & Engine Fundamentals	3
AUTO1120	Brakes, Steering & Suspensions	4
AUTO1130	Electrical & Electronic Principles	7
Natural Science/Mathematics		2
Credits		16
Total Credits		16
Course	Title	Credits
First Year		
Spring		
TTEN1210	Dealer Service Systems	3
TTEN1220	Body Electrical Systems	4
TTEN1230	Advanced Brakes & Suspension Systems	3
Communications		3



General Electives		3
	Credits	16
	Total Credits	16
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Fall</b>		
TTEN2110	Drivetrain Systems	7
TTEN2120	Heating & Air Conditioning	2
TTEN2131	TTEN Internship I	4
Social Sciences		3
General Electives		3
	Credits	19
	Total Credits	19
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
TTEN2210	Engine Diagnostics & Repair	3
TTEN2220	Engine Performance Repair	6
TTEN2231	TTEN Internship II	4
Humanities		3
General Electives		3
	Credits	19
	Total Credits	19

## Courses

### Course Descriptions

#### AUTO1110 | General Skills & Engine Fundamentals | Lec/Lab (3 Credits)

Use tools and measuring instruments. Identify fasteners and fittings, remove damaged fasteners, fabricate brake lines. Research service procedures using automotive information systems. Disassemble and assemble component engines. Describe engine parts, systems, and operation.

#### AUTO1120 | Brakes, Steering & Suspensions | Lec/Lab (4 Credits)

Examine theory of design and principles of operation, diagnosis and repair procedures of automotive brake, steering and suspension systems. Practice performing service procedures, four-wheel alignments, tire and wheel service.

#### AUTO1130 | Electrical & Electronic Principles | Lec/Lab (7 Credits)

Examine theory and principles of: Ohm's law, circuit principles, magnetism, electromagnetism, batteries, induction, cranking motors, charging systems, basic electronics including semiconductors. Use digital multimeters and wiring schematics to trace, test, and diagnose circuits. Disassemble, inspect, test, and reassemble starters and alternators. On-vehicle diagnosis of battery, starting, and charging systems.

#### TTEN1210 | Dealer Service Systems | Lec/Lab (3 Credits)

Introduction to dealership systems: repair order writing, dealership management training, and Toyota/Lexus Interactive Networking systems. Emphasis will be on vehicle inspection techniques; utilization of Toyota scan tools in troubleshooting advanced computer controlled vehicles.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

#### TTEN1220 | Body Electrical Systems | Lec/Lab (4 Credits)

Theory of operation and diagnostic principles of Toyota/Lexus chassis and body electrical systems. On-vehicle component testing with the latest scan tools, digital multi-meters, lab scopes and factory electrical schematics.

**Prerequisite(s):** TTEN1220

#### TTEN1230 | Advanced Brakes & Suspension Systems | Lec/Lab (3 Credits)

Theory of operation and diagnostic principles of Toyota/Lexus brake/suspension systems. ABS (Anti-lock braking system), traction control systems, advanced steering stability systems, pre-alignment inspections. 4-wheel alignment, suspension and steering systems, component repair and replacement, troubleshooting vibration, noise, and harshness concerns.

**Prerequisite(s):** TTEN1210 And TTEN1220

#### TTEN2110 | Drivetrain Systems | Lec/Lab (7 Credits)

Theory of operation and diagnostic principles of Toyota/Lexus drivetrain systems. Differentials, CV and universal joints, manual transmissions, transfer cases, automatic transmissions. System maintenance, periodic service, and on-vehicle diagnosis. Disassembly, inspection, and assembly of system components. CVT transmission and hybrid transmission.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

#### TTEN2120 | Heating & Air Conditioning | Lec/Lab (2 Credits)

Theory of operation and diagnostic principles of Toyota/Lexus air conditioning and heating systems. Refrigeration system service, control system repair, heater service, automatic heating/AC systems, component testing, environmental issues, and troubleshooting the various systems.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

#### TTEN2131 | TTEN Internship I | Internship (4 Credits)

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

#### TTEN2210 | Engine Diagnostics & Repair | Lec/Lab (3 Credits)

Hands-on repair of the Toyota/Lexus engines. Service procedures include cooling system repair, lubrication system repair, intake systems repair, exhaust repair, engine testing, engine replacement, engine disassembly, cleaning and measurement, cylinder head diagnostics, timing belt/chain replacement 4cyl, 6cyl, 8cyl.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

#### TTEN2220 | Engine Performance Repair | Lec/Lab (6 Credits)

Hands-on repair of the Toyota/Lexus fuel and computerized engine control systems. Service procedures include: fuel pressure testing, fuel injector testing, exhaust gas analysis, advanced scan tool usage, and on-vehicle diagnostics. Advanced diagnostics, including hands-on repair of the Toyota/Lexus engine control systems. Service procedures include: on-vehicle diagnostics of Toyota/Lexus including advanced computer control systems, networking communication, emission control systems, and test drive diagnostic techniques.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

#### TTEN2231 | TTEN Internship II | Internship (4 Credits)

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

## Computer Technology Department

- Computer Networking Systems (CNTS), AAS (p. 26)
- Computer Networking Technician (CNET), AAS (p. 28)
- Computer Networking Technician (CNET), Certificate (p. 29)
- Computer Systems Analysis (BCSA), Bachelor of Science (p. 31)
- Web Development (CDEV), AAS (p. 33)
- Web Programming & Database Development (CWEB), AAS (p. 35)

# Computer Networking Systems (CNTS), AAS

The Computer Networking Systems program prepares graduates for careers in the rapidly growing and changing field of IT. Students are taught current technologies and skills to architect, support, build, and maintain enterprise networks and systems. Those technologies include virtualization, IT security, directory services, network and systems automation, as well as routing and switching.

Coursework includes Microsoft and Linux operating systems, related network support services featuring Cisco® Academy curriculum, and desktop and server hardware. Skills in coding, computer logic, and data communications are developed as well. Interpersonal soft-skills are emphasized in all courses.

**Credential Earned:** AAS  
**Length of Program:** 2 years (4 semesters)  
**Classes Offered:** Day  
**Available Starts:** Fall Semester; Spring Semester  
**Bachelor's Completion Option(s):** Computer Systems Analysis (BCSA), Bachelor of Science (p. 31) | Business Management Leadership (AMGT), Bachelor of Science (p. 31)

## Program Outcomes

### Program Outcomes:

- Design, install, configure, maintain, and troubleshoot an enterprise network service.
- Install, configure, and maintain enterprise hardware.
- Design, implement, and optimize a virtualized enterprise environment.
- Use programming fundamentals for automating networks and services.
- Deploy relevant industry applications in an enterprise environment.
- Treatment of electronic theory to support advanced systems diagnostics.

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1250	Boolean Algebra	3
WRIT2010	Technical Writing	3
Diversity		2
Humanities		3
Social Sciences		3
<b>Technical Requirements</b>		
CNTS1111	Computer Systems	4
CNTS1121	Network Fundamentals	3
CWEB1010	Introduction to Web Development	3
CWEB1110	Programming Fundamentals	4
CNTS1210	Server Systems I	5
CNTS1230	Network Systems	4

CNTS2240	Administrative Scripting	3
CNTS1220	Routing & Switching I	5
CNTS2111	Server Systems II	5
CNTS2130	Virtualization	3
CNTS2120	Routing & Switching II	5
CNTS2211	Enterprise Application Administration	3
CNTS2223	Open Source Software	4
CNTS2250	Career Preparation	1
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CNTS1111	Computer Systems	4
CNTS1121	Network Fundamentals	3
CWEB1010	Introduction to Web Development	3
CWEB1110	Programming Fundamentals	4
MATH1250	Boolean Algebra	3
Credits		17
Total Credits		17

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
CNTS1210	Server Systems I	5
CNTS1230	Network Systems	4
CNTS2240	Administrative Scripting	3
MATH1050	Algebra, Trigonometry & Geometry	3
COMM1150	Interpersonal Communication	3
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
CNTS1220	Routing & Switching I	5
CNTS2111	Server Systems II	5
CNTS2130	Virtualization	3
Social Sciences		3
Humanities		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
CNTS2120	Routing & Switching II	5
CNTS2211	Enterprise Application Administration	3

CNTS2223	Open Source Software	4
CNTS2250	Career Preparation	1
WRIT2010	Technical Writing	3
Diversity		2
Credits		18
Total Credits		18

## Courses

### Course Descriptions

#### **CNTS1111 | Computer Systems | Lec/Lab (4 Credits)**

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

#### **CNTS1121 | Network Fundamentals | Lec/Lab (3 Credits)**

Concept and terminology introductions, data communications in a business environment. Client-server networking; communication hardware, software, and basic security is introduced. Services and models supporting data communications interoperability introduced. Configure and troubleshoot basic network connections and the hardware/software associated.

#### **CWEB1010 | Introduction to Web Development | Lec/Studio (3 Credits)**

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout. Integration of web scripting languages (like Javascript) into existing web pages to increase user-friendliness and functionality. Creation of scripts for new pages.

#### **CWEB1110 | Programming Fundamentals | Lec/Studio (4 Credits)**

Basic programming principles like data types, variables, expressions, operators, Boolean logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data-structures, object-oriented and event driven programming.

#### **CNTS1210 | Server Systems I | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage the primary services in the Microsoft Windows Server operating system. Introduction to the sharing of system resources, remote administration techniques to facilitate efficient and effective management of business computer systems.

**Prerequisite(s):** CNTS1110, Or CNTS1111, And CNTS1120, Or CNTS1121

#### **CNTS1230 | Network Systems | Lec/Lab (4 Credits)**

Expansion of concepts and terminology of business data communications and how they apply to the business environment. Intermediate to advanced client-server networking concepts, including its associated networking hardware, addressing and services. Logical addressing, IP routing, and network protocols. Installation and configuration of client-server networking systems.

**Prerequisite(s):** CNTS1121

#### **CNTS2240 | Administrative Scripting | Lec/Lab (3 Credits)**

Programming techniques that apply to managing computer systems and networks. Programming and its best practices, methods of code writing, and development of real world scripts used to manage enterprise networks.

#### **CNTS1220 | Routing & Switching I | Lec/Lab (5 Credits)**

Concepts and application of bridging, switching, and routing in an industry-standard networking environment. Install, configure, and manage networks, routers, and switches to facilitate basic network communication architectures. Portions of this course help to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNTS1120 Or CNTS1121

#### **CNTS2111 | Server Systems II | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage directory services for the network infrastructure including server deployment, terminal services, web services, network application services, planning, designing, and business continuity.

**Prerequisite(s):** CNTS1210

#### **CNTS2130 | Virtualization | Lec/Lab (3 Credits)**

Install, configure, maintain, and manage a variety of virtualization software; examine the underlying principles of virtualization; create a virtual IT infrastructure; advantages and disadvantages of moving to a virtualized environment; comparison of major virtualization software systems.

**Prerequisite(s):** CNTS1210

#### **CNTS2120 | Routing & Switching II | Lec/Lab (5 Credits)**

Advanced concepts and application of bridging, switching, and routing in an industry-standard networking environment. Practice advanced business network communication architectures. This course helps to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNTS1220

#### **CNTS2211 | Enterprise Application Administration | Lec/Lab (3 Credits)**

Install, configure, maintain, and manage Microsoft Exchange Server (email) and the considerations needed to optimize Exchange Server deployment. Managing and maintaining databases and multidimensional databases on Microsoft SQL Server. Development and deployment of SharePoint sites, security, database connectivity; administer and monitor SharePoint sites for use in a business setting.

**Prerequisite(s):** CNTS2111

#### **CNTS2223 | Open Source Software | Lec/Lab (4 Credits)**

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) with an emphasis on common web, file and database servers found in industry; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry. In-depth coverage of technologies related to hosting websites including programming language support, database support/connectivity, and remote access.

#### **CNTS2250 | Career Preparation | Lecture (1 Credit)**

Design a business resume, cover letter and thank you letter; implement a job search strategy, and submit resume, cover letter and thank you letter in search of an entry level job. Assemble artifacts for a student portfolio, create the portfolio, and present it to industry professionals.

#### **MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

#### **MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

# Computer Networking Technician (CNET), AAS

The Computer Networking Technician program is an evening program that prepares graduates for positions in computer networking and IT support. Students learn basic computer logic and the practical application of computer operations and maintenance. Courses include data communications; client and server operating systems (such as Microsoft Windows and Linux); networking technologies (including wireless networks and Cisco®); and basic programming. Students also learn about Microsoft applications, virtualization technologies, and IT security issues.

Arts & Sciences curriculum enhances the skills necessary for students to be successful in their career, including technical writing, communication, and math courses designed specifically for computer students. A shorter certificate option is also available.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester

**Bachelor's Completion Option(s):** Computer Systems Analysis (BCSA), Bachelor of Science (p. 31) | Business Management Leadership (AMGT), Bachelor of Science (p. 31)

## Program Outcomes

**Program Outcomes:**

- Install, configure and maintain computer client hardware and operating systems.
- Install, configure and maintain computer server hardware and operating systems.
- Configure and maintain basic network server file systems, user accounts, and group account.
- Install, configure and troubleshoot primary services in a networking environment.
- Install, configure and troubleshoot routing and switching protocols and technologies for a computer network.
- Install, configure and administer directory service systems including account principles and resources in a network environment.
- Secure a computer networking environment that spans the LAN, desktop system and extends out to a WAN, VPN, the internet, and other remote access situations.

- Install, configure, and administer business applications which related to data storage, communications, and productivity.
- Create script files that control, automate, and troubleshoot network environments.
- Research and evaluate new and emerging technologies for networks.

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1250	Boolean Algebra	3
WRIT2010	Technical Writing	3
Diversity		2
Humanities		3
Social Sciences		3
<b>Technical Requirements</b>		
CNET1110	Computer Systems	5
CNET1120	Network Fundamentals	5
CNET1210	Server Systems I	5
CNET1220	Routing & Switching I	5
CNET2110	Server Systems II	5
CNET2120	Routing & Switching II	5
CNET2210	Enterprise Application Administration	5
CNET2220	Open Source Software	5
Total Credits		60

## Sample Academic Plan

**Sample Academic Plan**

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CNET1110	Computer Systems	5
CNET1120	Network Fundamentals	5
MATH1250	Boolean Algebra	3
Humanities		3
Credits		16
Total Credits		16
<b>Second Year</b>		
<b>Spring</b>		
CNET1210	Server Systems I	5
CNET1220	Routing & Switching I	5
MATH1050	Algebra, Trigonometry & Geometry	3



Social Sciences		3
	Credits	16
	Total Credits	16
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Fall</b>		
CNET2110	Server Systems II	5
CNET2120	Routing & Switching II	5
COMM1150	Interpersonal Communication	3
Diversity		2
	Credits	15
	Total Credits	15
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
CNET2210	Enterprise Application Administration	5
CNET2220	Open Source Software	5
WRIT2010	Technical Writing	3
	Credits	13
	Total Credits	13

## Courses

### Course Descriptions

#### CNET1110 | Computer Systems | Lec/Lab (5 Credits)

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

#### CNET1120 | Network Fundamentals | Lec/Lab (5 Credits)

Concepts and terminology of business data communications and how it applies to the business environment. Introduction to client-server networking, associated networking devices, and services required to support a network and the current models governing interoperability. Portions of this course will provide preparation for the CompTIA Network + Certification.

#### CNET1210 | Server Systems I | Lec/Lab (5 Credits)

Install, configure, maintain, and manage the primary services in the Microsoft Windows Server operating system. Introduction to the sharing of system resources, remote administration techniques to facilitate efficient and effective management of business computer systems.

**Prerequisite(s):** CNET1110 And CNET1120

#### CNET1220 | Routing & Switching I | Lec/Lab (5 Credits)

Concepts and application of bridging, switching, and routing in an industry-standard networking environment. Install, configure, and manage networks, routers, and switches to facilitate basic network communication architectures. Portions of this course help to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNET1120

#### CNET2110 | Server Systems II | Lec/Lab (5 Credits)

Install, configure, maintain, and manage directory services for the network infrastructure including server deployment, terminal services, web services, network application services, planning, designing, and business continuity.

**Prerequisite(s):** CNET1210

#### CNET2120 | Routing & Switching II | Lec/Lab (5 Credits)

Advanced concepts and application of bridging, switching, and routing in an industry-standard networking environment. Practice advanced business network communication architectures. This course helps to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNET1220

#### CNET2210 | Enterprise Application Administration | Lec/Lab (5 Credits)

Install, configure, maintain, and manage Microsoft Exchange Server (e-mail) and the considerations needed to optimize Exchange Server deployment. Managing and maintaining databases and multidimensional databases on Microsoft SQL Server. Development and deployment of SharePoint sites, security, database connectivity; administer and monitor SharePoint sites for use in a business setting.

**Prerequisite(s):** CNET2110

#### CNET2220 | Open Source Software | Lec/Lab (5 Credits)

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) including OSS desktop productivity software; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry.

#### MATH1250 | Boolean Algebra | Lecture (3 Credits)

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

#### MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

#### COMM1150 | Interpersonal Communication | Lecture (3 Credits)

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

#### WRIT2010 | Technical Writing | Lecture (3 Credits)

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

## Computer Networking Technician (CNET), Certificate

### Overview

The Computer Networking Technician program is an evening program that prepares graduates for positions in computer networking and IT support. Students learn basic computer logic and the practical application of computer operations and maintenance. Courses include data communications; client and server operating systems (such as Microsoft Windows and Linux); networking technologies (including wireless networks and Cisco®); and basic programming. Students also learn about Microsoft applications, virtualization technologies, and IT security issues.



Arts & Sciences curriculum enhances the skills necessary for students to be successful in their career, including technical writing, communication, and math courses designed specifically for computer students.

Credits earned in the Computer Networking Technician certificate directly transfer into Dunwoody's Computer Networking Technician (CNET) (p. 28) associate's degree program.

**Credential Earned:** Certificate  
**Length of Program:** 1 years (2 semesters)  
**Classes Offered:** Evening  
**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- Install, configure and maintain computer client hardware and operating systems.
- Install, configure and maintain computer server hardware and operating systems.
- Configure and maintain basic network server file systems, user accounts, and group account.
- Install, configure and troubleshoot primary services in a networking environment.
- Install, configure and troubleshoot routing and switching protocols and technologies for a computer network.
- Install, configure and administer directory service systems including account principles and resources in a network environment.
- Secure a computer networking environment that spans the LAN, desktop system and extends out to a WAN, VPN, the internet, and other remote access situations.
- Install, configure, and administer business applications which related to data storage, communications, and productivity.
- Create script files that control, automate, and troubleshoot network environments.
- Research and evaluate new and emerging technologies for networks.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1250	Boolean Algebra	3
<b>Technical Requirements</b>		
CNET1110	Computer Systems	5
CNET1120	Network Fundamentals	5
CNET1210	Server Systems I	5
CNET1220	Routing & Switching I	5
Total Credits		23

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what

transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CNET1110	Computer Systems	5
CNET1120	Network Fundamentals	5
MATH1250	Boolean Algebra	3
Credits		13
Total Credits		13
<b>Spring</b>		
CNET1210	Server Systems I	5
CNET1220	Routing & Switching I	5
Credits		10
Total Credits		10

## Courses

### Course Descriptions

#### CNET1110 | Computer Systems | Lec/Lab (5 Credits)

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/ installation for machines commonly found in a business.

#### CNET1120 | Network Fundamentals | Lec/Lab (5 Credits)

Concepts and terminology of business data communications and how it applies to the business environment. Introduction to client-server networking, associated networking devices, and services required to support a network and the current models governing interoperability. Portions of this course will provide preparation for the CompTIA Network + Certification.

#### CNET1210 | Server Systems I | Lec/Lab (5 Credits)

Install, configure, maintain, and manage the primary services in the Microsoft Windows Server operating system. Introduction to the sharing of system resources, remote administration techniques to facilitate efficient and effective management of business computer systems.

**Prerequisite(s):** CNET1110 And CNET1120

#### CNET1220 | Routing & Switching I | Lec/Lab (5 Credits)

Concepts and application of bridging, switching, and routing in an industry-standard networking environment. Install, configure, and manage networks, routers, and switches to facilitate basic network communication architectures. Portions of this course help to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNET1120

#### MATH1250 | Boolean Algebra | Lecture (3 Credits)

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

# Computer Systems Analysis (BCSA), Bachelor of Science

The Computer Systems Analysis bachelor's completion program is a two-year evening program designed for students who have an existing two-year degree or certificate in networking, programming, or databases. The program prepares students to analyze procedures, methods, and uses of computer systems. Graduates develop the critical thinking, troubleshooting, and analytical skills to help companies build and maintain computer systems, design and implement network systems, design software, or make changes to hardware to improve routine habits. They also learn how to study an organization's current computer systems and procedures and make recommendations to management to help the organization operate more efficiently and effectively.

Coursework includes such topics as IT security, management information systems, and computer architecture. Students also have a choice of electives in networking, software, or data architecture. Arts & Sciences courses enhance and support the technical coursework.

**Credential Earned:** BS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- Demonstrate critical thinking skills applicable to performance in a technical business.
- Explain issues and concepts clearly using business, management, and technical terminology.
- Evaluate computer technology and software in a technical business environment.
- Interpret and communicate quantitative data.
- Complete tasks independently and within a team environment.
- Analyze technical operation's impact on a business' financial state and progress.
- Develop and utilize fundamental computer science/systems principles.
- Master technical writing skills necessary to write proper documentation.
- Explain critical technical aspects to management, peers, and direct reports at appropriate levels of detail.
- Adapt instructions to the needs of management, peers, and direct reports to fulfill necessary business operations.

## Degree Requirements

### Degree Requirements

Admitted students to Computer Systems Analysis (BCSA) can transfer up to 40 technical and 20 Arts & Sciences credits. A transfer evaluation is required. Not all credits may transfer into the degree program.

Computer Systems Analysis (BCSA) also has the following prerequisite courses, which may be taken at Dunwoody after acceptance into the program if the requirements have not been met during prior study: WRIT2010 and MATH1250.

Code	Title	Credits
<b>Transfer Credits</b>		60
<b>General Requirements</b>		
MATH1700	Pre Calculus	3
MATH1810	Calculus I	3
MATH1820	Calculus II	3
PHYS1810	Calculus-Based Physics	3
PSYC3000	Organizational Behavior	2
WRIT4020	Capstone Technical Writing	2
Upper Communications		2
Upper Humanities		2
<b>Technical Requirements</b>		
BCSA3100	Computer Architecture	3
BCSA3110	Discrete Mathematics	3
BCSA3120	Systems Analysis Practicum	3
IENG4135	Operations Management	2
BCSA3200	Operating Systems	3
BCSA3210	Algorithms/Data Structures	3
IENG4210	Simulation Modeling and Analysis	3
MGMT4230	Management Information Systems I	2
BCSA4100	Security	3
BCSA4110	Formal Languages & Automata	3
BCSA4120	Database Technologies	3
BCSA4200	Capstone	3
BCSA4210	Software Engineering	2
BCSA4230	Network Architecture	2
IENG4145	Engineering Economic Analysis	2
Total Credits		120

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
BCSA3100	Computer Architecture	3
BCSA3110	Discrete Mathematics	3
BCSA3120	Systems Analysis Practicum	3
IENG4135	Operations Management	2
MATH1700	Pre Calculus	3
Upper Humanities		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
BCSA3200	Operating Systems	3
BCSA3210	Algorithms/Data Structures	3
IENG4210	Simulation Modeling and Analysis	3
MGMT4230	Management Information Systems I	2
MATH1810	Calculus I	3
	Credits	14
	Total Credits	14
<b>Second Year</b>		
<b>Fall</b>		
BCSA4100	Security	3
BCSA4110	Formal Languages & Automata	3
BCSA4120	Database Technologies	3
MATH1820	Calculus II	3
PSYC3000	Organizational Behavior	2
Upper Communications		2
	Credits	16
	Total Credits	16
<b>Second Year</b>		
<b>Spring</b>		
BCSA4200	Capstone	3
BCSA4210	Software Engineering	2
BCSA4230	Network Architecture	2
IENG4145	Engineering Economic Analysis	2
PHYS1810	Calculus-Based Physics	3
WRIT4020	Capstone Technical Writing	2
	Credits	14
	Total Credits	14

## Courses

### Course Descriptions

#### BCSA3100 | Computer Architecture | Lec/Lab (3 Credits)

Introduction to computer architecture, processors, instruction sets, and assembly language programming.

#### BCSA3110 | Discrete Mathematics | Lecture (3 Credits)

Examine the logic-related mathematical background necessary for upcoming courses. Topics include: logic, sets, functions (as defined in the Mathematics domain), sequences, algorithmic complexity, number theory, matrices, proof of complexity, mathematical induction, recursion, counting, probability, and graph and tree fundamentals.

#### BCSA3120 | Systems Analysis Practicum | Practicum (3 Credits)

Survey of the various approaches for software development from traditional systems analysis to contemporary agile methods, Unified Modeling Language (UML), and object-oriented design. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

#### IENG4145 | Engineering Economic Analysis | Lecture (2 Credits)

The concepts of finance and economics within the engineering environment. Analyze costs, risk, funding options, economic return on investment, and legal and environmental concerns.

**Prerequisite(s):** MATH1810

#### BCSA3200 | Operating Systems | Lec/Lab (3 Credits)

Analyze the purpose of operating systems. Topics include: elements of operating systems, memory and process management, interactions among major components of computer systems, and an examination of the effects of computer architecture on operating systems.

**Prerequisite(s):** BCSA3100

#### BCSA3210 | Algorithms/Data Structures | Lec/Lab (3 Credits)

Investigate the creation of algorithms, the study of the running time or complexity of the proposed solution, and interesting related problems with algorithms, including some which cannot be solved by machines. Review well-known algorithms, including those in the areas of searching, sorting, scheduling, tree and graph traversal to understand algorithms and the data structures used to solve them efficiently, like linked lists, stacks, queues, and recursion structures.

**Prerequisite(s):** BCSA3100

#### IENG4210 | Simulation Modeling and Analysis | Lecture (3 Credits)

Utilize simulation to create, analyze, and evaluate realistic models of real-world environments. Topics include Monte Carlo simulation, queuing theory, selecting input distributions, animation in simulation, and evaluating simulation output.

**Prerequisite(s):** MATH1810

#### MGMT4230 | Management Information Systems I | Lecture (2 Credits)

The ways in which management and information services influence business strategies, communications technology, information systems analysis and design; issues arising out of the rapidly evolving field of information systems, and a general overview of IT compliance.

#### BCSA4100 | Security | Lec/Lab (3 Credits)

Explore fundamental and emerging concepts of computer security. Topics include: maintaining information confidentiality, protecting information integrity, assuring information availability, physical, technical, application, and Internet security, social engineering and associated attacks.

#### BCSA4110 | Formal Languages & Automata | Lec/Lab (3 Credits)

Determine how proper programming languages and systems are created. Examine formal logic and models of computation including finite state automata, pushdown automata, and Turing machines. Investigate problems for which a formal solution is not possible, problems which cannot be solved by finite, or real, machines, and problems for which complete solutions are not possible but 'good enough', or heuristic solutions.

**Prerequisite(s):** BCSA3210

#### BCSA4120 | Database Technologies | Practicum (3 Credits)

Database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

#### BCSA4200 | Capstone | Capstone (3 Credits)

An industry (field)-specific capstone project of student's choice. Present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** BCSA4100 And BCSA4110

#### BCSA4210 | Software Engineering | Lec/Lab (2 Credits)

Introduction to software engineering as an area of computer science. Focused study of requirements and requirements engineering; overview of various modeling techniques applicable to requirements and specifications, including UML and formal modeling.

**BCSA4230 | Network Architecture | Lec/Lab (2 Credits)**

Concepts and fundamental principles in modern network design and implementation that span LAN/WAN using TCP/IP and Ethernet. Review of topics related to layered models such as the OSI and TCP/IP logic models. Particular focus on the areas of network design and optimization. Specification of a network's physical and logical components and their function related to facilitating business processes, as well as network testing and documentation for the purpose of analyzing current architectures for improved performance.

**IENG4145 | Engineering Economic Analysis | Lecture (2 Credits)**

The concepts of finance and economics within the engineering environment. Analyze costs, risk, funding options, economic return on investment, and legal and environmental concerns.

**Prerequisite(s):** MATH1810

**MATH1700 | Pre Calculus | Lecture (3 Credits)**

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

**General Education:** Mathematics

**MATH1810 | Calculus I | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MACH2140

**Corequisite(s):** IENG3220, PHYS1800, PHYS1810

**General Education:** Mathematics

**MATH1820 | Calculus II | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as calculating the area under curves or the capacities inside of complex geometries. Computer software will enable the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH2200

**Corequisite(s):** PHYS1820

**General Education:** Mathematics

**PSYC3000 | Organizational Behavior | Lecture (2 Credits)**

Basic principles of human behavior that are used when managing individuals and groups in organizations. Includes theories relating to individual differences in abilities and attitudes, attribution, motivation, group dynamics, power and politics, leadership, conflict resolution, organizational culture, organizational structure and design as well as the process of ethical decision making for the employee, manager, and organization.

**General Education:** Upper Social Sciences

**PHYS1810 | Calculus-Based Physics | Lecture (3 Credits)**

Introduction to mechanics using calculus, vectors and graphs to describe motion, and to analyze it in terms of forces and conservation laws. Applications include projectiles, orbits, oscillations and fluids.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Natural Sciences

**WRIT4020 | Capstone Technical Writing | Lecture (2 Credits)**

Research, plan, and organize professional documents for the capstone project. Topics include assessment techniques, special audience considerations, professional speaking skills, and presentation aids.

**General Education:** Upper Communications

## Web Development (CDEV), AAS

The Web Development program provides graduates with the necessary skills and knowledge to design, create, and maintain websites that are well-coded, efficient, aesthetically pleasing, useful, data-driven, and user-friendly. Typical job titles for graduates from the program include web developer, webmaster, data analyst, web designer, content manager, and software developer. Coursework includes training in mobile and web development, including open-source and proprietary object-oriented and scripting languages; industry-standard database creation and data retrieval; good coding practices and programming logic; website design; navigation paradigms; data structures; and structure query language (SQL) and its use with database management systems. It also includes the study of operating systems, including Windows and Linux/Unix development.

Courses are divided between content lectures, hands-on demonstration, and practice. Arts & Sciences curriculum enhances the skills necessary for students to be successful in their career, including technical writing, communication, and math courses designed specifically for computer students.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester

**Bachelor's Completion Option(s):** Computer Systems Analysis (BCSA), Bachelor of Science (p. 31) | Business Management Leadership (AMGT), Bachelor of Science (p. 31)

## Program Outcomes

### Program Outcomes:

- Evaluate the organizational structure of a business in order to facilitate data management.
- Illustrate networks used for the internet.
- Determine that a database is properly structured.
- Create web solutions using a variety of programming languages.
- Articulate development solutions to peers and supervisors.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1250	Boolean Algebra	3
WRIT2010	Technical Writing	3
Diversity		2
Humanities		3
Social Sciences		3
<b>Technical Requirements</b>		
CDEV1010	Introduction to Web Development	3

CDEV1011	Programming Fundamentals I	2
CNET1110	Computer Systems	5
CDEV1110	Advanced Programming	4
CDEV1111	Programming Fundamentals II	2
CDEV1120	Data Organization	4
CDEV2000	Business Architecture	3
CDEV2011	Business Applications	4
CDEV2020	Databases: Philosophy & Practice	3
CDEV2110	Web Publishing	5
CNET2220	Open Source Software	5
Total Credits		60

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CDEV1010	Introduction to Web Development	3
CDEV1011	Programming Fundamentals I	2
CNET1110	Computer Systems	5
MATH1250	Boolean Algebra	3
Humanities		3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
CDEV1010	Introduction to Web Development	3
CDEV1111	Programming Fundamentals II	2
CDEV1120	Data Organization	4
MATH1050	Algebra, Trigonometry & Geometry	3
Social Sciences		3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
CDEV2000	Business Architecture	3
CDEV2011	Business Applications	4
CDEV2020	Databases: Philosophy & Practice	3
COMM1150	Interpersonal Communication	3
Diversity		2
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
CDEV2110	Web Publishing	5
CNET2220	Open Source Software	5
WRIT2010	Technical Writing	3
Credits		13
Total Credits		13

## Courses

### Course Descriptions

#### CDEV1010 | Introduction to Web Development | Lec/Studio (3 Credits)

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting and layout. Integration of web scripting languages (like JavaScript) into existing web pages to increase user-friendliness and functionality. Creation of scripts for new pages.

#### CDEV1011 | Programming Fundamentals I | Lecture (2 Credits)

Basic programming principles like data types, variables, expressions, operators, Boolean Logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data structures.

#### CNET1110 | Computer Systems | Lec/Lab (5 Credits)

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

#### CDEV1110 | Advanced Programming | Lec/Studio (4 Credits)

Create windows based applications. High-level, event-driven programming language concepts with an emphasis on user interface. Advanced object-oriented languages.

#### CDEV1111 | Programming Fundamentals II | Lecture (2 Credits)

Object-oriented and event driven-programming. Program construction, software creation problem-solving. Programming structures and coding recipes. Concrete application of concepts using easy-to-use but fully functional programming languages. Visual coding and environments. Game theory including collision and boundary detection. Versioning systems, testing strategies, change management tools.

#### CDEV1120 | Data Organization | Lec/Studio (4 Credits)

Language syntax, document model, document types, schemas and stylesheets from eXtensible Markup Language (XML) with a focus on creating structured content and data for business application. Integration of relational database concepts and design of database management systems for enterprise information needs. Business rules analyzed to diagram data models with Unified Modeling Language (UML). Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

#### CDEV2000 | Business Architecture | Lec/Studio (3 Credits)

Business concepts such as human resource development, marketing, investing, security, legal, and entrepreneurship. Types of businesses including e-commerce, consulting, outsourcing, and training topics. Various development approaches for software development from traditional systems analysis to contemporary agile methods and beyond. Developing models and prototypes to practice the processes and techniques needed to design and build quality software systems.



**CDEV2011 | Business Applications | Lecture (4 Credits)**

Transition of static HTML web sites to complex data integrated applications. Server-side scripting. Difference between coding a page and coding a site or full project. Customization and integration of many complex pieces of code and parts of a web site into a single cohesive web application.

**CDEV2020 | Databases: Philosophy & Practice | Lec/Studio (3 Credits)**

Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, security. Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas.

**CDEV2110 | Web Publishing | Lec/Studio (5 Credits)**

Techniques central to web publishing. Open-source and proprietary languages built for the web. Tools used to publish content online. Interactive, data-driven web applications for web storefronts. Scripting templates, databases, file system, directories and other enterprise systems for developing web application services.

**CNET2220 | Open Source Software | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) including OSS desktop productivity software; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry.

**MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

## Web Programming & Database Development (CWEB), AAS

The Web Programming & Database Development program provides graduates with the necessary skills and knowledge to design, create, and maintain websites. While the goal of user-friendly, efficient, and appealing website design is expected, adherence to industry standards and best practices is paramount.

Typical job titles for graduates of the program include web developer, webmaster, database administrator, data analyst, web designer, content

manager, and software developer. Students learn responsive web development; client and server-side scripting; object-oriented languages; industry-standard database creation and management; secure coding practices and programming logic; current industry project management techniques; basic user interface and user experience principles; data structures; and structured query language (SQL) within multiple database systems. They also learn how to use Windows and Linux (\*nix) based systems.

Courses are divided between content lectures and hands-on demonstrations and practice. Arts & Sciences curriculum enhances the skills necessary for students to be successful in their careers. These courses include technical writing, communication, and math courses designed specifically for computer students. The program culminates in a comprehensive final/capstone that incorporates the knowledge learned throughout the program.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Bachelor's Completion Option(s):** Computer Systems Analysis (BCSA), Bachelor of Science (p. 31) | Business Management Leadership (AMGT), Bachelor of Science (p. 31)

## Program Outcomes

### Program Outcomes:

- Create web solutions using a variety of programming languages.
- Articulate development solutions to peers and supervisors.
- Use appropriate project management strategies for software development.
- Evaluate and implement data structures for applications and business.
- Apply secure programming techniques during development efforts.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1250	Boolean Algebra	3
WRIT2010	Technical Writing	3
Diversity		2
Humanities		3
Social Sciences		3
<b>Technical Requirements</b>		
CNTS1111	Computer Systems	4
CNTS1121	Network Fundamentals	3
CWEB1010	Introduction to Web Development	3
CWEB1110	Programming Fundamentals	4
CWEB2101	Business Architecture	4
CWEB1111	Programming Fundamentals II	3
CWEB1120	Data Organization	4
GAPT1150	Introduction to Color Theory	1
CWEB2010	Advanced Programming	4

CWEB2020	Database Servers	3
CWEB2111	Web Publishing	3
GAPT2120	Web Graphics	2
CNTS2223	Open Source Software	4
CNTS2250	Career Preparation	1
CWEB2011	Business Applications	4
CWEB2121	Database Systems	2
CWEB2135	Advanced Topics	3
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CNTS1111	Computer Systems	4
CNTS1121	Network Fundamentals	3
CWEB1010	Introduction to Web Development	3
CWEB1110	Programming Fundamentals	4
MATH1250	Boolean Algebra	3
Credits		17
Total Credits		17

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
CWEB2101	Business Architecture	4
CWEB1111	Programming Fundamentals II	3
CWEB1120	Data Organization	4
GAPT1150	Introduction to Color Theory	1
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
CWEB2010	Advanced Programming	4
CWEB2020	Database Servers	3
CWEB2111	Web Publishing	3
GAPT2120	Web Graphics	2
Humanities		3
Social Sciences		3
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
CNTS2223	Open Source Software	4
CNTS2250	Career Preparation	1
CWEB2011	Business Applications	4
CWEB2121	Database Systems	2
CWEB2135	Advanced Topics	3
WRIT2010	Technical Writing	3
Diversity		2
Credits		19
Total Credits		19

## Courses

### Course Descriptions

#### CNTS1111 | Computer Systems | Lec/Lab (4 Credits)

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

#### CNTS1121 | Network Fundamentals | Lec/Lab (3 Credits)

Concept and terminology introductions, data communications in a business environment. Client-server networking; communication hardware, software, and basic security is introduced. Services and models supporting data communications interoperability introduced. Configure and troubleshoot basic network connections and the hardware/software associated.

#### CWEB1010 | Introduction to Web Development | Lec/Studio (3 Credits)

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout. Integration of web scripting languages (like Javascript) into existing web pages to increase user-friendliness and functionality. Creation of scripts for new pages.

#### CWEB1110 | Programming Fundamentals | Lec/Studio (4 Credits)

Basic programming principles like data types, variables, expressions, operators, Boolean logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data-structures, object-oriented and event driven programming.

#### CWEB2101 | Business Architecture | Lec/Studio (4 Credits)

Business concepts such as human resource development, marketing, investing, security, legal, and entrepreneurship. Various development approaches for software development from traditional systems analysis to contemporary methods (like Agile) and beyond. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

#### CWEB1111 | Programming Fundamentals II | Lec/Studio (3 Credits)

Intermediate programming principles like abstraction, modularization, dynamic and static data-structures, object-oriented and event driven-programming more in-depth. Classes and inheritance. Program construction, software creation problem-solving. Programming structures and coding recipes. Concrete application of concepts using easy-to-use but fully functional programming languages. Visual coding and environments. Game theory including collision and boundary detection.

**Prerequisite(s):** CWEB1110

**CWEB1120 | Data Organization | Lec/Studio (4 Credits)**

Language syntax, document model, document types, schemas and stylesheets from eXtensible Markup Language (XML) with a focus on creating structured content and data for business application. Integration of relational database concepts and design of database management systems for enterprise information needs. Data modeling with Unified Modeling Language (UML) and Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

**GAPT1150 | Introduction to Color Theory | Lecture (1 Credit)**

The importance and power of color in graphic communication, brand identity, and color reproduction. Color psychology, science and applications. Hands-on exploration of RGB, LAB and CMYK color spaces.

**CWEB2010 | Advanced Programming | Lec/Studio (4 Credits)**

Create windows based applications. High level, event driven programming language concepts with an emphasis on user interface. Advanced object-oriented languages.

**Prerequisite(s):** CWEB1110

**CWEB2020 | Database Servers | Lec/Studio (3 Credits)**

Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas, normalization, data warehouses, data mining, data cubes.

**Prerequisite(s):** CWEB1120

**CWEB2111 | Web Publishing | Lec/Studio (3 Credits)**

Techniques central to web publishing. Open-source and proprietary languages built for the web. Tools used to publish content online. Interactive, data-driven web applications for web storefronts. Scripting templates, databases, file system, directories and other enterprise systems for developing web application services.

**Prerequisite(s):** CWEB2010

**GAPT2120 | Web Graphics | Lec/Lab (2 Credits)**

Introduction to web design from creating wire frames to finished mockups. Emphasis is on web page layout and the creation and formatting of the graphic elements on a web page.

**Prerequisite(s):** CWEB1000, Or CWEB1010, Or CDEV1010

**CNTS2223 | Open Source Software | Lec/Lab (4 Credits)**

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) with an emphasis on common web, file and database servers found in industry; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry. In-depth coverage of technologies related to hosting websites including programming language support, database support/connectivity, and remote access.

**CNTS2250 | Career Preparation | Lecture (1 Credit)**

Design a business resume, cover letter and thank you letter; implement a job search strategy, and submit resume, cover letter and thank you letter in search of an entry level job. Assemble artifacts for a student portfolio, create the portfolio, and present it to industry professionals.

**CWEB2011 | Business Applications | Lec/Studio (4 Credits)**

Transition of static hypertext markup language (HTML) web sites to complex data integrated applications. Server-side scripting. Differentiate between coding a page and coding a site or full project. Customize and integrate many complex pieces of code and parts of a web site into a single cohesive web application.

**Prerequisite(s):** CWEB1110

**CWEB2121 | Database Systems | Studio (2 Credits)**

Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, and security.

**Prerequisite(s):** CWEB1120

**CWEB2135 | Advanced Topics | Capstone (3 Credits)**

Emerging technologies advanced topics. Career preparation work. Perfecting job skills. Resumes, cover letters, interview skills. Portfolio or external project work to exhibit all skills gained throughout program. Seminar/independent study format.

**MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

## Construction Sciences & Building Technology Department

- Architectural Drafting & Design (ARCH), AAS (p. 38)
- Architecture (BARCH), Bachelor of Architecture (p. 40)
- Construction Management (CMGT), Bachelor of Science (p. 42)
- Construction Project Management (PMGT), AAS (p. 44)
- Construction Project Management (PMGT), Certificate (p. 47)
- Electrical Construction & Maintenance (ELEC), AAS (p. 48)
- Electrical Construction Design & Management (ECDM), AAS (p. 50)
- Facilities Operations & Management (FOPS), AAS (p. 52)
- Heating & Cooling Service Professional (HCSV), AAS (p. 55)
- HVAC Installation & Residential Service (HEAT), AAS (p. 58)
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- Interior Design (IDSN), Bachelor of Science (p. 65)
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- Surveying & Civil Engineering Technology (SCVL), AAS (p. 70)

# Architectural Drafting & Design (ARCH), AAS

The Architectural Drafting & Design Degree produces graduates who are experts in current design and building technologies, making them ideal employees in architecture, building design, and construction industries. Students are prepared to complete Dunwoody's three-year Bachelor of Architecture program or to work in the field as designers and drafters should they choose not to pursue professional licensure.

Students develop skills in a wide array of design technologies including sketching, drawing, manual drafting, digital drafting, physical modeling, digital and parametric modeling, building information modeling, architectural visualization, and digital fabrication. This is combined with study in building technologies including structural systems, building envelope systems, building service systems, building environment systems, building codes, and project management. Students develop professional skills through portfolio and project management courses, opportunities for governance, and frequent interaction with industry professionals in and out of the classroom

Arts & Sciences study rounds out the program, including courses in oral and written communications; math and science; social and behavioral studies; and arts and humanities.

- Credential Earned:** AAS
- Length of Program:** 2 years (4 semesters)
- Classes Offered:** Day
- Available Starts:** Fall Semester
- Bachelor's Completion Option(s):** Architecture (BARCH), Bachelor of Architecture (p. 40) | Business Management Leadership (AMGT), Bachelor of Science (p. 40)

## Program Outcomes

### Program Outcomes:

- Design: to harness the capacity of established and emerging design and building technologies and generate a capacity for architectural discovery.
- Technology: to embrace and participate in the current and profound changes in design and building technologies.
- The Profession: to create a generation of architects ideally poised to become leaders in the architecture profession.
- Communication: to explore vast architectural modes of representation, documentation and presentation.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
General Requirements		
ARTS1000	Introduction to Drawing	3
SPCH1000	Speech	3
Communications		3
Mathematics		3
Natural Sciences		3
Social Sciences		3
General Electives		2
Technical Requirements		

ARCH1102	Studio 1 - Drawing Mechanics	5
ARCH1104	Building Systems	3
ARCH1203	Building Codes & Regulations	3
CSBT1000	AEC Seminar	1
ARCH1201	Construction Documents	1
ARCH1202	Studio 2 - Documentation	5
ARCH1204	Structure & Envelope	3
ARCH2203	Material Strengths	3
ARCH2102	Studio 3 - Design Development	5
ARCH2103	Project Management	3
ARCH2104	Building Service Systems	3
ARCH2105	Economics of Practice	1
ARCH2201	Portfolio	1
ARCH2202	Studio 4	5
ARCH2204	Building Envelope & Environment	3
ARCH2205	Economics of Building	3
Total Credits		68

## Sample Academic Plan

### Sample Academic Plan

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Course	Title	Credits
First Year		
Fall		
ARCH1102	Studio 1 - Drawing Mechanics	5
ARCH1104	Building Systems	3
ARCH1203	Building Codes & Regulations	3
CSBT1000	AEC Seminar	1
ARTS1000	Introduction to Drawing	3
Social Sciences		3
Credits		18
Total Credits		18

Course	Title	Credits
First Year		
Spring		
ARCH1201	Construction Documents	1
ARCH1202	Studio 2 - Documentation	5
ARCH1204	Structure & Envelope	3
ARCH2203	Material Strengths	3
Mathematics		3
Communications		3
Credits		18
Total Credits		18

Course	Title	Credits
Second Year		
Fall		
ARCH2102	Studio 3 - Design Development	5



ARCH2103	Project Management	3
ARCH2104	Building Service Systems	3
ARCH2105	Economics of Practice	1
SPCH1000	Speech	3
Natural Sciences		3
Credits		18
Total Credits		18
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
ARCH2201	Portfolio	1
ARCH2202	Studio 4	5
ARCH2204	Building Envelope & Environment	3
ARCH2205	Economics of Building	3
General Electives		2
Credits		14
Total Credits		14

## Courses

### Course Descriptions

#### ARCH1102 | Studio 1 - Drawing Mechanics | Studio (5 Credits)

Introduction to the evolution of architectural drawing, from hand drafting to building information modeling, in this first foundational design studio. Redraw a full set of construction documents using hand and digital techniques to develop a proficiency in the mechanics of architectural drawing.

#### ARCH1104 | Building Systems | Lecture (3 Credits)

Examine primary building systems and their associative materials and assemblies. With a focus on current building systems, analyze existing buildings through photography, physical tours, and diagrammatic drawing to achieve a broad knowledge of primary structural systems.

#### ARCH1203 | Building Codes & Regulations | Lecture (3 Credits)

Introduction to the current acts and codes which guide the building design process. Analyze an existing building and perform a detailed code analysis and review to develop a proficiency in reading, using, and applying building codes and regulations.

#### CSBT1000 | AEC Seminar | Seminar (1 Credit)

Introduction to the academic and classroom culture. Develop a proficiency in communication skills including research, oral presentation, writing, and collaboration.

#### ARCH1201 | Construction Documents | Seminar (1 Credit)

Exposure to varying theories, organizational principles, and legal implications of construction drawings and specifications. Research and analyze examples of technical documentation to achieve a basic knowledge of the practical and legal organization of building information.

#### ARCH1202 | Studio 2 - Documentation | Studio (5 Credits)

Engage in the generation of construction drawings in this second foundational design studio. Draw, coordinate and publish a full set of construction drawings from a given set of resolved design development drawings and outline specifications to develop a proficiency in construction documents.

**Prerequisite(s):** ARCH1102

#### ARCH1204 | Structure & Envelope | Lecture (3 Credits)

Introduction to aspects of building assemblies relative to their energy performance, moisture control, durability, and resource efficiency. Research multiple existing buildings through various means to achieve a broad knowledge of varying strategies for the building structure and envelope.

#### ARCH2203 | Material Strengths | Lecture (3 Credits)

Introduction to the fundamentals of material behavior. Examine the physical changes a body undergoes when acted upon by forces. Investigate stress and strain relations, shear forces, bending moments, and beam deflections.

**Prerequisite(s):** MATH1050

#### ARCH2102 | Studio 3 - Design Development | Studio (5 Credits)

Engage in the design development process, in this third foundational studio, with an emphasis on accessibility and health safety. Design and develop details, specifications, and construction documents from a given resolved schematic design to develop a proficiency in design development.

**Prerequisite(s):** ARCH1202

#### ARCH2103 | Project Management | Lecture (3 Credits)

Introduction to the legal and work flow issues within the context of varying project delivery methods. Research the work flow, organization of information, and decision making structures of specific projects currently in progress at local firms to develop a broad knowledge of project management.

#### ARCH2104 | Building Service Systems | Lecture (3 Credits)

Introduction to the principles of embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, day lighting, artificial lighting and acoustics. Research multiple existing buildings through various means to achieve a broad knowledge of varying environmental systems.

#### ARCH2105 | Economics of Practice | Seminar (1 Credit)

Introduction to the financial considerations surrounding the practice of architecture and related construction fields. Analyze the value of design by monetary measure based on varying delivery methods, design processes, and practice models.

#### ARCH2201 | Portfolio | Seminar (1 Credit)

Focus is on the communication and organization of a professional portfolio, resume and application for employment or advancement in higher learning. Develop a personal portfolio to develop a proficiency in documenting and presenting previously completed works.

#### ARCH2202 | Studio 4 | Studio (5 Credits)

Engage in the interpretation of design intent, in this final foundational studio, with a focus on sustainability. Resolve and develop into construction documents an early schematic design to achieve a proficiency in the architectural process from resolved schematic design to construction documents.

**Prerequisite(s):** ARCH2102

#### ARCH2204 | Building Envelope & Environment | Lecture (3 Credits)

Introduction to the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, conveying systems, security, and fire protection systems. Research multiple existing buildings through various means to achieve a broad knowledge of varying building service systems.



**ARCH2205 | Economics of Building | Lecture (3 Credits)**

Introduction to a broad range of standard building conditions and their economic impact. Engage in a full economic analysis of select buildings and develop diagrams, preliminary cost estimates, and life cycle cost analysis to achieve a broad knowledge of building economics.

**ARTS1000 | Introduction to Drawing | Lecture (3 Credits)**

Analyze basic drawing concepts and techniques through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Work from observation using line, tone and other elements of art to solve spatial, compositional and light problems to accurately render the illusion of 3-dimensional form on a 2-dimensional surface.

**General Education:** Humanities

**SPCH1000 | Speech | Lecture (3 Credits)**

Introduction to public speech making; purpose and organization, audience analysis and response, verbal and non-verbal clues.

**General Education:** Communications

# Architecture (BARCH), Bachelor of Architecture

The Bachelor of Architecture completion degree provides graduates with the capacity to become licensed, practicing architects and leaders in the profession. The program is specifically designed for students who are continuing on from Dunwoody's Architectural Drafting & Design associate's degree as well as graduates of other two-year design and building technologies programs.

Building on their associate's degree, students harness advanced design and building technologies as a design tool to conceive of comprehensive architectural works. They also learn to design in historical and cultural contexts through courses in history, theory, culture, study abroad, and community design build. In addition, students develop leadership skills through courses in professional practice and Architectural Registration Exam preparation.

Programs of study in Arts & Sciences and Business Management round out the program, including courses in critical and creative thinking, research methods, marketing, accounting, and management.

**Credential Earned:** BARCH

**Length of Program:** 3 years (6 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- **Design:** to harness the capacity of established and emerging design and building technologies and generate a capacity for architectural discovery.
- **Technology:** to embrace and participate in the current and profound changes in design and building technologies.
- **The Profession:** to create a generation of architects ideally poised to become leaders in the architecture profession.
- **Communication:** to explore vast architectural modes of representation, documentation and presentation.

## Degree Requirements

Admitted students to Architecture (BARCH) can transfer up to 40 technical and 24 Arts & Sciences credits. A transfer evaluation is required. Not all credits may transfer into the degree program.

Code	Title	Credits
<b>Transfer Credits:</b>		64
<b>General Requirements</b>		
HUMN3600	Critical & Creative Thinking	3
RSCH4000	Research Methods	3
<b>Technical Requirements</b>		
ARCH3101	Architecture Seminar A	1
ARCH3102	Studio 5 - Site & Precedent	5
ARCH3203	History of Architecture I	3
ARCH3201	Architecture Seminar B	1
ARCH3202	Studio 6 - Program & Client	5
ARCH4104	History of Architecture II	3
MGMT1000	Principles of Accounting	3
MGMT1100	Principles of Marketing	3
ARCH3103	Architectural Theory	3
ARCH4101	Architecture Seminar C	1
ARCH4102	Studio 7 - Interdisciplinary	5
ARCH4103	Structures	3
ARCH4203	Culture	4
ARCH4204	Studio 8 - Abroad/Design Build	7
ARCH4205	Architecture Seminar D	1
ARCH5101	Architecture Seminar E	1
ARCH5103	Professional Practice	3
ARCH5104	Studio 9 - Comprehensive I	7
MGMT3112	Business Management	3
ARCH5201	Architecture Seminar F	1
ARCH5202	Studio 10 - Comprehensive II	8
ARCH5203	Applied Research	3
<b>Technical &amp; Arts &amp; Sciences Elective</b>		
Choose any technical or Arts & Sciences courses		6
Total Credits		150

## Sample Academic Plan

### Sample Academic Plan

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Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ARCH3101	Architecture Seminar A	1

ARCH3102	Studio 5 - Site & Precedent	5
ARCH3203	History of Architecture I	3
HUMN3600	Critical & Creative Thinking	3
RSCH4000	Research Methods	3
Natural Sciences/Mathematics		4
Credits		19
Total Credits		19

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ARCH3201	Architecture Seminar B	1
ARCH3202	Studio 6 - Program & Client	5
ARCH4104	History of Architecture II	3
MGMT1000	Principles of Accounting	3
MGMT1100	Principles of Marketing	3
Humanities		4
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
ARCH3103	Architectural Theory	3
ARCH4101	Architecture Seminar C	1
ARCH4102	Studio 7 - Interdisciplinary	5
ARCH4103	Structures	3
Any technical or Arts & Sciences courses		3
Social Sciences		4
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
ARCH4203	Culture	4
ARCH4204	Studio 8 - Abroad/Design Build	7
ARCH4205	Architecture Seminar D	1
General Electives		6
Credits		18
Total Credits		18

Course	Title	Credits
<b>Third Year</b>		
<b>Fall</b>		
ARCH5101	Architecture Seminar E	1
ARCH5102	Studio 9 - Comprehensive I	6
ARCH5103	Professional Practice	3
Any technical or Arts & Sciences courses		3
Communications		4
General Electives		2
Credits		19
Total Credits		19

## Courses

### Course Descriptions

#### ARCH3101 | Architecture Seminar A | Seminar (1 Credit)

Introduction to established and emerging ways of thinking about architectural space and form. Explore physical and digital modes of representation to develop skills that utilize design thinking, ordering systems, and investigative skills.

#### ARCH3102 | Studio 5 - Site & Precedent | Studio (5 Credits)

This first design studio introduces students to design thinking and fundamental design skills with an emphasis on site and precedent. Students will be given a site and program to develop cultural, typological, theoretical, and historical frameworks upon which to conceive an architectural work.

#### ARCH3203 | History of Architecture I | Lecture (3 Credits)

This survey course introduces students to the world of architecture throughout the history of human settlement up to the modern era. Particular attention is given to the histories of design technologies and building science as well as the evolution of the role of the architect in human civilization.

#### ARCH3201 | Architecture Seminar B | Seminar (1 Credit)

Explore physical and digital modes of representation to develop ordering skills utilizing design thinking, ordering systems, and investigative skills.

#### ARCH3202 | Studio 6 - Program & Client | Studio (5 Credits)

This studio engages students in pre-design processes including the assessment of client and user needs, analysis of site, and building on acquired design principles, students will be given a site and a user to develop a comprehensive program to conceive of and develop an architectural work.

#### ARCH4104 | History of Architecture II | Lecture (3 Credits)

This lecture and research course introduces students to architecture of the modern movement up to present day. Critical writings, conceptual design works, current lectures, and building tours will be studied and synthesized so students may gain an individual position on the present and future condition of architectural history.

#### MGMT1000 | Principles of Accounting | Lecture (3 Credits)

Introduction to fundamental accounting concepts and cycles. Includes analyzing, interpreting, and recording transactions, as well as the preparation of financial statements, bank reconciliations and payroll transactions in accordance with commonly accepted accounting principles.

#### MGMT1100 | Principles of Marketing | Lecture (3 Credits)

Introduction to terms, concepts, and skills for analyzing marketing problems. Manage/integrate communication aspects of marketing, such as advertising, sales promotion, and public relations. Identify how to set objectives, select media and measure effectiveness. Explain sales promotion techniques.

#### ARCH3103 | Architectural Theory | Lecture (3 Credits)

This survey course introduces students to a multitude of architectural ideas across human history. Critical writings, conceptual design works, and current lectures will be studied and synthesized so students may begin to find a personal theoretical framework.

#### ARCH4101 | Architecture Seminar C | Seminar (1 Credit)

Physical and digital modes of representation used to develop presentation skills utilizing design thinking, ordering systems, and investigative skills.

#### ARCH4102 | Studio 7 - Interdisciplinary | Studio (5 Credits)

This studio requires students to produce an architectural work as part of an interdisciplinary team. Students will be given a complex program and context. Students will achieve the capacity to collaborate across disciplines, synthesize their knowledge of previous studios, and make design decisions across multiple design factors.

**ARCH4103 | Structures | Lecture (3 Credits)**

This applied research course focuses on the advanced study of statics and strengths of materials. Students will perform comparative analysis of structural systems using emerging or alternative materials against industry standards. Analysis will involve mathematical documentation of hands on testing. Students will develop a proficiency in architectural structures as well as a basic knowledge of architectural research.

**ARCH4203 | Culture | Lecture (4 Credits)**

Examine the relationship between architecture, representation and humanity. Immersion in an international architectural community to acquire a detailed knowledge of varying cultures and human behaviors and how they represent and manifest themselves architecturally.

**ARCH4204 | Studio 8 - Abroad/Design Build | Studio (7 Credits)**

In an immersive learning environment, develop a proficiency in design in varying cultural contexts. Acquire a detailed knowledge of varying cultures and human behaviors and how they represent and manifest themselves architecturally.

**ARCH4205 | Architecture Seminar D | Seminar (1 Credit)**

Physical and digital modes of representation used to explore skills utilizing design thinking, ordering systems, and investigative skills.

**ARCH5101 | Architecture Seminar E | Seminar (1 Credit)**

Physical and digital modes of representation used to understand design process utilizing design thinking, ordering systems, and investigative skills.

**ARCH5103 | Professional Practice | Lecture (3 Credits)**

This business course introduces students to successful models for owning, operating, and managing an architectural practice. Focus is given to business and marketing planning, as well as leadership in business management. Students will research varying established models and develop business and marketing plans to achieve a detailed knowledge of professional practice.

**ARCH5104 | Studio 9 - Comprehensive I | Studio (7 Credits)**

Demonstrate design skills through an architectural work which integrates critical and abstract thinking, with building systems knowledge, life safety considerations, financial, cultural and environmental balance, and construction documentation skills. Acquire a proficiency in integrated systems thinking and comprehensive design.

**MGMT3112 | Business Management | Lecture (3 Credits)**

Examine principles of management in the context of how firms are organized to analyze their management of finances, operations, human resources, processes and strategy to effectively meet an organization's mission, vision and goals.

**ARCH5201 | Architecture Seminar F | Seminar (1 Credit)**

Prepare for the Architectural Registration Exam through review and study of material most likely to be covered on all of the most current exams.

**ARCH5202 | Studio 10 - Comprehensive II | Studio (8 Credits)**

The second part of a yearlong studio is a culmination of the core curriculum. Design skills will be demonstrated through an architectural work which integrates critical and abstract thinking, with building systems knowledge, life safety considerations, financial, cultural and environmental balance, and construction documentation skills. Students will acquire a proficiency in integrated systems thinking and comprehensive design.

**ARCH5203 | Applied Research | Lecture (3 Credits)**

This applied research course seeks to advance the art and discipline of architecture through the development of new design and building technologies. Students will propose, test and develop undocumented or as yet not discovered design tools, building assemblies, fabrication methods, or materials. Students will develop a proficiency in an architectural research process.

**HUMN3600 | Critical & Creative Thinking | Lecture (3 Credits)**

Explore how critical thinking and creativity intersect through various theories to solve diverse, complex or abstract problems.

**General Education:** Upper Humanities

**RSCH4000 | Research Methods | Lecture (3 Credits)**

Analyze paradigms, methodologies, and rigorous writing processes for academic and practitioner works. Focus is on the critical investigation of readings, claims, planning, and research ethics.

**General Education:** Upper Communications

## Construction Management (CMGT), Bachelor of Science

The Construction Management bachelor's completion program prepares students to successfully manage, lead, and influence construction projects, teams, and companies. Graduates develop the critical thinking, problem solving, and decision making skills to take on professional roles as project managers, construction managers, business leaders, and entrepreneurs. Students in the program represent various construction industries and combine their specialized technical knowledge with leadership skills required to manage all phases and types of construction and make ethical and strategic decisions about the built environment.

Coursework features lectures on the principles of management and leadership, marketing, construction finance and law, green construction, and field engineering, with advanced training in estimating, planning and scheduling. Students also complete professional development projects and capstones within the construction industry. Arts & Sciences courses enhance a student's technical education through study in oral and written communications; math and physical science; social/behavioral studies; and the arts and humanities.

**Credential Earned:** BS

**Length of Program:** 2 years (4 semesters) Summer courses are available to reduce fall/spring course load. Evening AAS students may take up to 5 semesters to complete unless they have technical transfer credits.

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester; Summer Session

## Program Outcomes

### Program Outcomes:

- Create written communications appropriate to the construction discipline.
- Create oral presentations appropriate to the construction discipline.
- Create a construction project safety plan.
- Create construction project cost estimates.
- Create construction project schedules.
- Analyze professional decisions based on ethical principles.
- Analyze construction documents for planning and management of construction processes.
- Analyze methods, materials, and equipment used to construct projects.

- Apply construction management skills as a member of a multi-disciplinary team.
- Apply electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- Understand construction risk management.
- Understand construction accounting and cost control.
- Understand construction quality assurance and control.
- Understand construction project control processes.
- Understand the legal implications of contract, common, and regulatory law to manage a construction project.
- Understand the basic principles of sustainable construction.
- Understand the basic principles of structural behavior.
- Understand the basic principles of mechanical, electrical and piping systems.

## Degree Requirements

## Degree Requirements

Admitted students to Construction Management (CMGT) can transfer up to 44 technical and 20 Arts & Sciences credits. A transfer evaluation is required. Not all credits may transfer into the degree program.

Construction Management (CMGT) also has the following prerequisite courses, which may be taken at Dunwoody after acceptance into the program if the requirements have not been met during prior study: CMGT1211, CMGT1231 and CSBT2110

Code	Title	Credits
<b>Transfer Credits:</b>		64
<b>General Requirements</b>		
MATH1700	Pre Calculus	3
Upper Humanities		2
Upper Physical/Environmental Science with Lab		3
Upper Psychology		2
<b>Technical Requirements</b>		
CMGT3111	Construction Law	3
CMGT3121	Construction Estimating II	3
CMGT3130	Quality Assurance & Risk	3
CMGT3211	Construction Accounting & Finance	3
CMGT3221	Construction Planning & Scheduling II	3
MGMT1100	Principles of Marketing	3
CMGT4120	Field Engineering	3
CMGT4130	Green Construction	3
CMGT4006	Professional Development	1
CMGT4211	Construction Topics II	3
CMGT4220	Utility & Construction Design	3
<b>Technical Elective (Choose one course):</b>		3
CMGT4501	Project Management	
CMGT4110	Project Management: 4yr CM Competition	
<b>Technical Elective</b>		
Choose any AMGT/MGMT courses		6

<b>Technical Elective</b>	
Choose any CMGT courses	6
Total Credits	120

## Sample Academic Plan

## Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
Any AMGT/MGMT courses		2
CMGT3111	Construction Law	3
CMGT3121	Construction Estimating II	3
CMGT3130	Quality Assurance & Risk	3
MATH1700	Pre Calculus	3
Credits		14
Total Credits		14

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
Any AMGT/MGMT courses		4
CMGT3211	Construction Accounting & Finance	3
CMGT3221	Construction Planning & Scheduling II	3
Credits		10
Total Credits		10

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
MGMT1100	Principles of Marketing	3
CMGT4120	Field Engineering	3
CMGT4130	Green Construction	3
CMGT4501 or CMGT4110	Project Management or Project Management: 4yr CM Competition	3
Upper Physical/Environmental Science with Lab		3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
Any CMGT courses		6
CMGT4006	Professional Development	1
CMGT4211	Construction Topics II	3
CMGT4220	Utility & Construction Design	3
Upper Psychology		2
Upper Humanities		2
Credits		17
Total Credits		17

## Courses

### Course Descriptions

#### **CMGT3111 | Construction Law | Lecture (3 Credits)**

Examine the components of Construction Law using case law studies and construction documents to understand and identify the legal issues and liabilities encountered in connection with a construction project.

#### **CMGT3121 | Construction Estimating II | Lec/Lab (3 Credits)**

Advanced analysis of the quantity surveying, cost estimating, and bidding methods of building construction using current industry practices and methods to oversee and manage the successful procurement of projects.

#### **CMGT3130 | Quality Assurance & Risk | Lecture (3 Credits)**

Analyze the best allocation of people, processes, material, and equipment based on quality and productivity principles and expectations to maintain an efficient and safe work environment.

#### **CMGT3211 | Construction Accounting & Finance | Lecture (3 Credits)**

Apply basic accounting and finance concepts in the construction industry to analyze project data and financial statements to forecast, monitor and manage the costs of a construction project. Analyze the unique characteristics of construction accounting and finance through their use in budget development, securing funding, and cash flow to forecast the implementation of business decisions on financial statements.

#### **CMGT3221 | Construction Planning & Scheduling II | Lec/Lab (3 Credits)**

Advanced principles and techniques of managing construction schedules to forecast and report progress for construction projects.

#### **MGMT1100 | Principles of Marketing | Lecture (3 Credits)**

Introduction to terms, concepts, and skills for analyzing marketing problems. Manage/integrate communication aspects of marketing, such as advertising, sales promotion, and public relations. Identify how to set objectives, select media and measure effectiveness. Explain sales promotion techniques.

#### **CMGT4120 | Field Engineering | Lecture (3 Credits)**

Analyze statics and strength of materials as used for the application of material specifications, quality control, and testing required in the field. Emphasis on field documentation and verification of subcontractor work.

#### **CMGT4130 | Green Construction | Lecture (3 Credits)**

Examine green building principles and best practices through laboratory exercises, research, discussions, case studies, and presentations; apply to industry documents to understand the green building industry.

#### **CMGT4501 | Project Management | Lecture (3 Credits)**

Integrate project management with documentation prepared for review by an industry review panel. Emphasis is on creation and coordination of plans, schedules, estimates, finance, marketing analysis, risk, insurance, and green initiatives for a site development project.

#### **CMGT4110 | Project Management: 4yr CM Competition | Laboratory (3 Credits)**

Integrate residential project management with documentation prepared for review by an industry review panel and a presentation at an industry sponsored national student competition. Emphasis is on creation and coordination of plans, schedules, estimates, finance, marketing analysis, risk, insurance, and green initiatives for a site development project. Students are selected by faculty to register for this course.

#### **CMGT4006 | Professional Development | Directed Study (1 Credit)**

Integrate managerial and leadership skills in a related industry setting to acquire real world experience in an area of student interest.

#### **CMGT4211 | Construction Topics II | Lecture (3 Credits)**

Investigate a selected topic in various areas of construction allowing a problem of special interest to be further examined.

#### **CMGT4220 | Utility & Construction Design | Lecture (3 Credits)**

Examine the infrastructure systems related to public works projects produced in the United States; presented and discussed through a series of speakers, field trips and readings in order for construction professionals to realize the importance of our infrastructure systems and how they affect our society, including an analysis of current and future needs.

#### **MATH1700 | Pre Calculus | Lecture (3 Credits)**

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

**General Education:** Mathematics

## Construction Project Management (PMGT), AAS

The Construction Project Management AAS degree is designed to address the increasing demand for formally trained project managers, estimators, and field personnel. The program prepares students for various entry-level positions in the construction industry. Construction project management requires highly developed critical thinking, problem solving, and decision making skills to manage individual and team performance and functional oversight of a project life cycle.

Through the use of instructional projects, students learn the tools to become leaders of the construction team, including how to develop and manage schedules and estimates; how to monitor and report on the progress of construction activities to stakeholders; and how to track and control construction costs. Key themes include risk and safety management, ethical and legal implications, and financial decision making. Courses utilize tangible local projects to examine best practices, industry standards, and applications with curriculum specifically designed to emulate various jobs performed in the professional work environment. Current industry software is used to create and manage documents for student projects. In addition, service learning projects, site visits, speakers, and lab exercises introduce students to industry and community partners with a directed focus on gaining an appreciation for the social and environmental responsibilities that extend beyond creating the built environment.

Arts & Sciences courses round out the course of study, providing students with the analytical, communication, and writing skills the industry demands of its professionals. The program also includes a capstone project. A shorter certificate option is also available.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters) Evening AAS students may take up to 5 semesters to complete unless they have technical transfer credits.

**Classes Offered:** Day; Evening

**Available Starts:** Fall Semester; Spring Semester; Summer Session

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42)



## Program Outcomes

### Program Outcomes:

- Create written communications appropriate to the construction discipline.
- Create oral presentations appropriate to the construction discipline.
- Create a construction project safety plan.
- Create construction project cost estimates.
- Create construction project schedules.
- Analyze professional decisions based on ethical principles.
- Analyze construction documents for planning and management of construction processes.
- Analyze methods, materials, and equipment used to construct projects.
- Apply electronic-based technology to manage the construction process.
- Apply basic surveying techniques for construction layout and control.
- Understand construction accounting and cost control.
- Understand the legal implications of contract, common, and regulatory law to manage a construction project.
- Understand the basic principles of structural behavior.
- Understand the basic principles of mechanical, electrical and piping systems.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
ECON1000	Introduction to Micro & Macro Economics	3
HUMN2400	Ethics	2
MATH1050	Algebra, Trigonometry & Geometry	3
SPCH1000	Speech	3
Communications		3
CMGT1111	The Construction Industry	2
CMGT1131	Construction Plans & Measurements	3
CSBT1000	AEC Seminar	1
CSBT1002	Construction Drafting	3
SCVL1111	Introduction to Surveying	3
CMGT1211	Construction Estimating I	3
CMGT1231	Construction Planning & Scheduling I	3
CSBT2110	Building Codes	3
SCVL2111	Materials, Testing, Construction Methods	3
Psychology		3
Physical/Environmental Science with Lab		3
<b>Technical Requirements</b>		
CMGT1221	Construction Materials & Methods II	3
CMGT2131	Construction Safety	2
CMGT2211	Integrated Environmental Systems	3
CMGT2203	Construction Mgmt Statics & Structures	3
CMGT2221	Construction Administration	2
CMGT2230	Commercial Project Management	3
<b>Technical Elective (Choose one course):</b>		3
CMGT2150	Residential Project Management	

CMGT2500	Project Management: NAHB 2 yr Competitio	
<b>Technical Elective (Choose one course):</b>		1
CMGT1310	Construction Topics I	
CSBT2000	Professional Development	
CMGT1901	International AEC Fields & Practices	
<b>Total Credits</b>		64

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CMGT1111	The Construction Industry	2
CMGT1131	Construction Plans & Measurements	3
CSBT1000	AEC Seminar	1
CSBT1002	Construction Drafting	3
SCVL1111	Introduction to Surveying	3
HUMN2400	Ethics	2
MATH1050	Algebra, Trigonometry & Geometry	3
<b>Credits</b>		17
<b>Total Credits</b>		17

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
CMGT1211	Construction Estimating I	3
CMGT1231	Construction Planning & Scheduling I	3
CSBT2110	Building Codes	3
SCVL2111	Materials, Testing, Construction Methods	3
Communications		3
Psychology		3
<b>Credits</b>		18
<b>Total Credits</b>		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
CMGT1221	Construction Materials & Methods II	3
CMGT2131	Construction Safety	2
CMGT2211	Integrated Environmental Systems	3
CMGT2150 or CMGT2500	Residential Project Management or Project Management: NAHB 2 yr Competitio	3
ECON1000	Introduction to Micro & Macro Economics	3
SPCH1000	Speech	3
<b>Credits</b>		17
<b>Total Credits</b>		17

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
CMGT2203	Construction Mgmt Statics & Structures	3

CMGT2221	Construction Administration	2
CMGT2230	Commercial Project Management	3
CMGT1310 or CSBT2000 or CMGT1901	Construction Topics I or Professional Development or International AEC Fields & Practices	1
Physical/Environmental Science with Lab		3
Credits		12
Total Credits		12

## Courses

### Course Descriptions

#### CMGT1111 | The Construction Industry | Lecture (2 Credits)

Aspects of the construction industry presented using interviews with practicing professionals, site tours, and exploratory reflections to illustrate the many opportunities available as a professional.

#### CMGT1131 | Construction Plans & Measurements | Lecture (3 Credits)

Interpret architectural and engineering graphics and conventions using construction documents to identify materials and calculate quantities.

#### CSBT1000 | AEC Seminar | Seminar (1 Credit)

Introduction to the academic and classroom culture. Develop a proficiency in communication skills including research, oral presentation, writing, and collaboration.

#### CSBT1002 | Construction Drafting | Lec/Lab (3 Credits)

Implement construction graphics and conventions using hand drafting and drawing software.

#### SCVL1111 | Introduction to Surveying | Lec/Lab (3 Credits)

Introduction to the technical equipment and industry processes used by surveying technicians to collect and interpret data.

#### CMGT1211 | Construction Estimating I | Lec/Lab (3 Credits)

Integrate material quantities with costs through take-offs, estimates and bid analysis, to predict project costs.

**Prerequisite(s):** CMGT1131

#### CMGT1231 | Construction Planning & Scheduling I | Lec/Lab (3 Credits)

Analyze a sequence of construction tasks using network diagrams, Gantt charts, and the critical path method to create a project schedule.

**Prerequisite(s):** CMGT1131

#### CSBT2110 | Building Codes | Lecture (3 Credits)

Select and apply appropriate federal, state/provincial and municipal codes, standards and accessibility guidelines using industry standards with an emphasis on Life Safety Codes and the ADA to prepare for licensing exams, meet with codes officials, and to design spaces that enhance the health, safety and welfare of the general public.

#### SCVL2111 | Materials, Testing, Construction Methods | Lec/Lab (3 Credits)

Introduction to testing construction materials and methods, inspection and quality control. Examine construction documents to estimate quantities and costs for civil projects.

#### CMGT1221 | Construction Materials & Methods II | Lec/Lab (3 Credits)

Examine building materials and construction methods through deconstruction of building systems using case studies, field trips and hands on exercises to figure out how buildings are assembled. Emphasis on the methods and materials for the interior of buildings.

#### CMGT2131 | Construction Safety | Lecture (2 Credits)

Examine the principles of construction safety and identify health hazards using the Occupational Safety and Health Administration (OSHA) 1926 Construction Industry Regulations and MNO SHA Laws and Rules. Emphasis is on OSHA 30-hour Construction standards.

#### CMGT2211 | Integrated Environmental Systems | Lecture (3 Credits)

Examine mechanical, electrical, plumbing and fire protection systems using case studies to coordinate the integration of these disciplines.

#### CMGT2150 | Residential Project Management | Laboratory (3 Credits)

Integrate residential project management skills to create and coordinate plans, schedules, and estimates for a site development residential project utilizing construction competition guidelines.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

#### CMGT2500 | Project Management: NAHB 2 yr Competitio | Laboratory (3 Credits)

Integrate residential project management with documentation prepared for review by an industry review panel and a presentation at the National Association of Home Builders (NAHB) annual student competition. Emphasis is on creation and coordination of plans, schedules and estimates. Students are selected by faculty to register for this course.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

#### CMGT2203 | Construction Mgmt Statics & Structures | Lecture (3 Credits)

Evaluate structural behavior, structural materials, and load resistance for vertical and horizontal projects. Focus is on how construction managers work with designers.

**Prerequisite(s):** MATH1050

#### CMGT2221 | Construction Administration | Lecture (2 Credits)

Examine the requirements of Construction Administration using industry standard formats and procedures to understand the administrative requirements for their implications on a construction project.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

#### CMGT2230 | Commercial Project Management | Laboratory (3 Credits)

Manage a construction project from Request for Proposals through closeout integrating software; best practices and ethical decision making illustrate the competencies required of a construction project manager/site supervisor. Emphasis on overall culmination of prerequisite skills achieved in prior courses.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

#### CMGT1310 | Construction Topics I | Seminar (1 Credit)

Investigate a selected topic in various areas of construction allowing a problem of special interest to be further examined.

#### CSBT2000 | Professional Development | Seminar (1 Credit)

Apply technical skills in a related industry setting to acquire real world experience in an area of student interest.

#### CMGT1901 | International AEC Fields & Practices | Travel Study (1 Credit)

Introduction to the international aspects of architecture, engineering, and construction industries. Emphasis on inter-cultural communication, cultural intelligence, and globalization of technology. Four traditional classroom sessions (held before travel) include lectures, seminar discussions, case studies, participatory activities, and guest speaker presentations. Coursework during travel is primarily experiential based and includes fieldwork, group projects and community based service-learning. Travel expenses are incurred by the student.

#### MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**HUMN2400 | Ethics | Lecture (2 Credits)**

The development of ethical standards as related to the individual, government, business, and society. Current legislation is examined from the perspective of its moral and ethical roots with considerations and standards influencing personal and business decisions.

**General Education:** Diversity

**ECON1000 | Introduction to Micro & Macro Economics | Lecture (3 Credits)**

Fundamental economic issues and theories are explored through discussion and research. Current events, policy perspectives, and case studies are used to process and apply economics to everyday life.

**General Education:** Social Sciences

**SPCH1000 | Speech | Lecture (3 Credits)**

Introduction to public speech making; purpose and organization, audience analysis and response, verbal and non-verbal clues.

**General Education:** Communications

## Construction Project Management (PMGT), Certificate

### Overview

The Construction Project Management certificate provides individuals with experience in the construction industry training in the field of construction project management. Construction project managers facilitate successful projects during all phases of design and construction. They are the construction team leaders in the field and in the office. Construction project managers develop and manage schedules and estimates and control and track construction costs. They seek to minimize risk by understanding risk management techniques including safety concerns, legal ramifications, codes and regulations, and financial decisions. Construction project managers monitor and report on the progress of construction activities to stakeholders. Through the use of instructional projects, students learn the tools to become leaders of the construction team, including how to develop and manage schedules and estimates; and how to monitor and report on the progress of construction activities to stakeholders. Key themes include risk and safety management, ethical and legal implications, and document controls. Courses utilize tangible projects to examine best practices, industry standards and applications with curriculum specifically designed to emulate various jobs performed in the professional work environment. Current industry software is used to create and manage documents for student projects. Instructed by practicing industry professionals, students learn to facilitate successful projects during all phases of construction.

Credits earned in the Construction Project Management (PMGT) certificate directly transfer into Dunwoody's Construction Project Management (PMGT) (p. 44) associate's degree program.

**Credential Earned:** Certificate

**Length of Program:** 1 Year (2 Semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester, Spring Semester, Summer Session

## Program Outcomes

### Program Outcomes:

- Interpret construction documents.
- Analyze building assemblies and systems during all phases of construction.

- Demonstrate proficiency in current industry software.
- Utilize industry equipment and tools for construction.
- Implement safe practices in the built environment.
- Implement bidding and estimating procedures.
- Recognize the regulatory environment in design and construction.
- Analyze phases of construction projects.
- Apply business management methods.

## Degree Requirements

Code	Title	Credits
CMGT1131	Construction Plans & Measurements	3
CMGT1211	Construction Estimating I	3
CMGT1231	Construction Planning & Scheduling I	3
CMGT2131	Construction Safety	2
CMGT2221	Construction Administration	2
CSBT2110	Building Codes	3
Total Credits		16

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CMGT1131	Construction Plans & Measurements	3
CMGT1211	Construction Estimating I	3
CMGT2131	Construction Safety	2
Credits		8
Total Credits		8
<b>Second Year</b>		
<b>Spring</b>		
CMGT1231	Construction Planning & Scheduling I	3
CMGT2221	Construction Administration	2
CSBT2110	Building Codes	3
Credits		8
Total Credits		8

## Courses

### Course Descriptions

#### CMGT1131 | Construction Plans & Measurements | Lecture (3 Credits)

Interpret architectural and engineering graphics and conventions using construction documents to identify materials and calculate quantities.

**CMGT1211 | Construction Estimating I | Lec/Lab (3 Credits)**

Integrate material quantities with costs through take-offs, estimates and bid analysis, to predict project costs.

**Prerequisite(s):** CMGT1131

**CMGT1231 | Construction Planning & Scheduling I | Lec/Lab (3 Credits)**

Analyze a sequence of construction tasks using network diagrams, Gantt charts, and the critical path method to create a project schedule.

**Prerequisite(s):** CMGT1131

**CMGT2131 | Construction Safety | Lecture (2 Credits)**

Examine the principles of construction safety and identify health hazards using the Occupational Safety and Health Administration (OSHA)1926

Construction Industry Regulations and MNOSHA Laws and Rules.

Emphasis is on OSHA 30-hour Construction standards.

**CMGT2221 | Construction Administration | Lecture (2 Credits)**

Examine the requirements of Construction Administration using industry standard formats and procedures to understand the administrative requirements for their implications on a construction project.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CSBT2110 | Building Codes | Lecture (3 Credits)**

Select and apply appropriate federal, state/provincial and municipal codes, standards and accessibility guidelines using industry standards with an emphasis on Life Safety Codes and the ADA to prepare for licensing exams, meet with codes officials, and to design spaces that enhance the health, safety and welfare of the general public.

# Electrical Construction & Maintenance (ELEC), AAS

Electrical Construction & Maintenance prepares students for a variety of entry-level positions within the electrical industry including construction, maintenance, manufacturing of electrical components, estimating, sales, and other related fields. The program incorporates lecture instruction with application in a laboratory environment to equip graduates with trade knowledge and skills.

Instruction begins with the science of electricity and transitions to various facets in the construction and manufacturing electrical industries. Components of the program include wiring methods, controls, power generation, electrical schematics and blueprints, and electrical and job site safety. Students apply the National Electrical Code to electrical installations and maintenance work while developing critical thinking skills to solve problems and make decisions. Arts & Sciences courses complement the technical major providing technical reading and writing skills, analytic and scientific reasoning, and a global perspective.

The Electrical Construction & Maintenance major is approved by the MN Department of Labor & Industry as a two-year electrical program. Satisfactory completion of an approved two-year electrical program fulfills the one year's experience credit allowance for a Class A journeyman electrician, power limited technician, or maintenance electrician license applicant according to part 3800.3520, subpart 5, items B, E, and I, and Minnesota Statutes, section 326B.33, subdivisions 2, paragraph (b), and 7, paragraph (b).

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** Minnesota Department of Labor & Industry approved two-year electrical program

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Demonstrate the mechanical skills necessary for electrical work.
- Interpret the National Electrical Code and other related applications.
- Apply the electrical code and theory with practical applications.
- Read, write, and evaluate electrical drawings.
- Install, maintain, and troubleshoot electrical systems and equipment.
- Demonstrate required industry safety standards.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM2000	Communication for Technical Professions	5
ECON1000	Introduction to Micro & Macro Economics	3
HUMN2400	Ethics	2
MATH1500	Algebra, Trig & Boolean Algebra	5
PHIL1000	Introduction to Logic	2
Physical/Environmental Science with Lab		3
<b>Technical Requirements</b>		
ELEC1111	AC & DC Electrical Lab	5
ELEC1112	AC & DC Electrical Principles	8
ELEC1211	AC & DC Machines & Controls Lab	5
ELEC1212	AC & DC Machines Principles	8
ELEC2111	Wiring & Electrical Systems Lab 1	5
ELEC2112	Wiring & Electrical Systems Principles 1	8
ELEC2211	Wiring & Electrical Systems Lab 2	5
ELEC2212	Wiring & Electrical Systems Principles 2	8
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELEC1111	AC & DC Electrical Lab	5
ELEC1112	AC & DC Electrical Principles	8
MATH1500	Algebra, Trig & Boolean Algebra	5
Credits		18
Total Credits		18

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ELEC1211	AC & DC Machines & Controls Lab	5
ELEC1212	AC & DC Machines Principles	8
PHIL1000	Introduction to Logic	2
Physical/Environmental Science with Lab		3
	Credits	18
	Total Credits	18
<b>Second Year</b>		
<b>Fall</b>		
ELEC2111	Wiring & Electrical Systems Lab 1	5
ELEC2112	Wiring & Electrical Systems Principles 1	8
COMM2000	Communication for Technical Professions	5
	Credits	18
	Total Credits	18
<b>Spring</b>		
ELEC2211	Wiring & Electrical Systems Lab 2	5
ELEC2212	Wiring & Electrical Systems Principles 2	8
ECON1000	Introduction to Micro & Macro Economics	3
HUMN2400	Ethics	2
	Credits	18
	Total Credits	18

## Courses

### Course Descriptions

#### ELEC1111 | AC & DC Electrical Lab | Laboratory (5 Credits)

Investigation and application of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, test equipment, circuit connections, and analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1112

#### ELEC1112 | AC & DC Electrical Principles | Lecture (8 Credits)

Examination of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, and circuit analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1111

#### ELEC1211 | AC & DC Machines & Controls Lab | Laboratory (5 Credits)

Investigation and analysis of AC and DC machines with both industrial and programmable logic control systems utilizing schematics and components to create and build electrical circuits with the inclusion of testing and troubleshooting procedures of equipment for a comprehensive analysis of industrial manufacturing systems.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC1212

#### ELEC1212 | AC & DC Machines Principles | Lecture (8 Credits)

Examination of DC and AC machine principles and theories with an emphasis on industrial manufacturing system calculations and analysis including use of the National Electrical code regulations for installations.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC1211

#### ELEC2111 | Wiring & Electrical Systems Lab 1 | Laboratory (5 Credits)

Implementation and installation of electric equipment, wiring methods and print reading for residential, light commercial and limited energy systems performed in a lab environment using proper safety practices and procedures.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2112

#### ELEC2112 | Wiring & Electrical Systems Principles 1 | Lecture (8 Credits)

Interpretation of the National Electrical Code and related calculations are examined and used to determine proper installation and use of wiring methods, devices and equipment in accordance with the National Electrical Code with a focus on residential and limited energy systems.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2111

#### ELEC2211 | Wiring & Electrical Systems Lab 2 | Laboratory (5 Credits)

Implementation of wiring methods for the installation of commercial, industrial, and renewable energy applications with an emphasis on various electrical systems utilizing blue prints, electrical schematics, estimating and take-off, and applicable industry standards along with the National Electrical Code within a laboratory environment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2212

#### ELEC2212 | Wiring & Electrical Systems Principles 2 | Lecture (8 Credits)

Examination of the methods and materials used for the design, operation, estimation, layout and installation of commercial, industrial, and renewable energy electrical systems utilizing applicable industry standards along with the National Electrical code.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2211

#### MATH1500 | Algebra, Trig & Boolean Algebra | Lecture (5 Credits)

Polynomials, proportions and linear equations. Trig functions, graphs, and vectors. Binary, octal and hexadecimal number systems. Boolean Algebra and mapping.

**General Education:** Mathematics

#### PHIL1000 | Introduction to Logic | Lecture (2 Credits)

Examine the principles of correct reasoning through the use of language; utilize formal rules of deductive reasoning.

**General Education:** Humanities

#### COMM2000 | Communication for Technical Professions | Lecture (5 Credits)

Develop the distinctive reading and writing skills critical to success in technical professions. Examine the role of and techniques used within the writing process; the interrelationship between content, language, and structure; and the relationship between the basic conventions of writing and the construction of meaning. Topics include strategies for collaborative and ethical writing in the workplace, creating and interpreting professional communications, and analyzing field-specific texts for application to a specific task and overall effectual performance.

**General Education:** Communications



ECON1000 | Introduction to Micro & Macro Economics | Lecture (3 Credits)

Fundamental economic issues and theories are explored through discussion and research. Current events, policy perspectives, and case studies are used to process and apply economics to everyday life.

General Education: Social Sciences

HUMN2400 | Ethics | Lecture (2 Credits)

The development of ethical standards as related to the individual, government, business, and society. Current legislation is examined from the perspective of its moral and ethical roots with considerations and standards influencing personal and business decisions.

General Education: Diversity

Electrical Construction Design & Management (ECDM), AAS

The Electrical Construction Design & Management program provides graduates with the knowledge and skills necessary for entry-level employment in the electrical engineering/construction industry.

Graduates of the program start a career as drafters, designers, estimators, or project managers at engineering firms or electrical contractor companies. Students receive training in fundamental electrical theory and application; motors, transformers and generators; electrical control systems; electrical installations and wiring; electrical safety; drafting and designing power, lighting and low voltage systems; lighting calculations; power system analysis; cost estimation; CSI specifications; and project management.

The National Electrical Code (NEC) is studied extensively. Students learn crucial problem-solving skills as they advance through the program. Arts & Sciences curriculum supports the technical skills students learn as well as enhance oral and written communication skills, fundamental math skills, and critical thinking ability.

Students also complete a capstone electrical engineering/construction project that integrates and documents all aspects of drafting, designing, specifying and analyzing, estimating, and managing.

Credential Earned: AAS

Length of Program: 2 years (4 semesters)

Classes Offered: Day

Available Starts: Fall Semester; Spring Semester

Bachelor's Completion Option(s): Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

Program Outcomes

Program Outcomes:

- Practice required industry safety standards.
- Demonstrate the wiring of electrical equipment and systems.
- Draft and interpret electrical projects.
- Cite the National Electrical Code for electrical projects.
- Design electrical systems for buildings.
- Estimate electrical construction projects.
- Manage electrical construction and engineering projects.

Degree Requirements

Code	Title	Credits
General Requirements		
MATH1500	Algebra, Trig & Boolean Algebra	5
	Communications	2
	Diversity	2
	Humanities	2
	Social Sciences	2
	General Electives	7
Technical Requirements		
ELEC1111	AC & DC Electrical Lab	5
ELEC1112	AC & DC Electrical Principles	8
ECDM2101	Electrical Theory & Practice - Delta	3
ECDM2102	Design Lab - Delta	3
ECDM2103	Illumination Technology & Design	4
ECDM2201	Electrical Theory & Practice - Omega	3
ECDM2202	Design Lab - Omega	3
ECDM2203	Electrical Estimating	3
CMGT1231	Construction Planning & Scheduling I	3
ECDM2301	Advanced Topics & Technology	3
CSBT2110	Building Codes	3
CMGT1313	Construction Contracts	1
Technical Elective (Choose one course):		1
ECDM2204	Electrical Field Studies	
CMGT1901	International AEC Fields & Practices	
Technical Elective (Choose one course):		3
ECDM2302	Design Capstone	
ECDM2303	ECDM Co-op/Internship	
Total Credits		66

Sample Academic Plan

Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
First Year		
Fall		
ELEC1111	AC & DC Electrical Lab	5
ELEC1112	AC & DC Electrical Principles	8
MATH1500	Algebra, Trig & Boolean Algebra	5
Credits		18
Total Credits		18

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ECDM2101	Electrical Theory & Practice - Delta	3
ECDM2102	Design Lab - Delta	3
ECDM2103	Illumination Technology & Design	4
Humanities		2
General Elective		4
Credits		16
Total Credits		16
<b>Second Year</b>		
<b>Fall</b>		
ECDM2201	Electrical Theory & Practice - Omega	3
ECDM2202	Design Lab - Omega	3
ECDM2203	Electrical Estimating	3
ECDM2204 or CMGT1901	Electrical Field Studies or International AEC Fields & Practices	1
Communications		2
General Elective		3
Credits		15
Total Credits		15
<b>Second Year</b>		
<b>Spring</b>		
CMGT1231	Construction Planning & Scheduling I	3
ECDM2301	Advanced Topics & Technology	3
ECDM2302 or ECDM2303	Design Capstone or ECDM Co-op/Internship	3
CSBT2110	Building Codes	3
CMGT1313	Construction Contracts	1
Social Sciences		2
Diversity		2
Credits		17
Total Credits		17

## Courses

### Course Descriptions

#### ELEC1111 | AC & DC Electrical Lab | Laboratory (5 Credits)

Investigation and application of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, test equipment, circuit connections, and analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1112

#### ELEC1112 | AC & DC Electrical Principles | Lecture (8 Credits)

Examination of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, and circuit analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1111

#### ECDM2101 | Electrical Theory & Practice - Delta | Lecture (3 Credits)

Principles and practices of electrical system design. Design and calculations involved in electrical construction. Apply occupant perspectives, construction techniques, and relevant codes. Examine the entire electrical system, with a focus on branch circuits and low voltage systems.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2102

#### ECDM2102 | Design Lab - Delta | Laboratory (3 Credits)

Electrical design of a simulated building project. This project covers utility to outlets, with a focus on branch circuits and low voltage systems. Practical design implementation is emphasized. Detailed documentation of all aspects of the project. CAD, Revit, and other modeling and analysis software is used to produce a final portfolio.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2101 ECDM2103

#### ECDM2103 | Illumination Technology & Design | Lec/Lab (4 Credits)

Interior and exterior applications of lighting. Discussion of energy code, including control system implementation and lighting power density. Analyze photometric data and their application. Use 3D modeling to design layouts, taking into account fixture selection and basic aesthetic considerations.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2102

#### ECDM2201 | Electrical Theory & Practice - Omega | Lecture (3 Credits)

Principles and practices of electrical system design. Design and calculations involved in electrical construction. Apply occupant perspectives, construction techniques, and relevant codes. Examine the entire electrical system, with a focus on distribution, such as transformers, generators, panels, and feeders.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2202

#### ECDM2202 | Design Lab - Omega | Laboratory (3 Credits)

Electrical design of simulated building project. This project covers utility to outlets, with a focus on distribution, such as transformers, generators, panels and feeders. Practical design implementation is emphasized. Detail documentation of all aspects of the project. Use contemporary 2D, 3D, and other modeling and analysis software to produce a final portfolio.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2201

#### ECDM2203 | Electrical Estimating | Lecture (3 Credits)

Detailed estimation and project management of electrical construction projects using industry software. Scheduling and bidding of construction projects and project documentations.

#### ECDM2204 | Electrical Field Studies | Laboratory (1 Credit)

Explore electrical systems in completed construction, and converse with owners and facility managers to discuss implications of design. Tour in-progress projects, and discuss project management obstacles and best practices.

#### CMGT1901 | International AEC Fields & Practices | Travel Study (1 Credit)

Introduction to the international aspects of architecture, engineering, and construction industries. Emphasis on inter-cultural communication, cultural intelligence, and globalization of technology. Four traditional classroom sessions (held before travel) include lectures, seminar discussions, case studies, participatory activities, and guest speaker presentations. Coursework during travel is primarily experiential based and includes fieldwork, group projects and community based service-learning. Travel expenses are incurred by the student.

**CMGT1231 | Construction Planning & Scheduling I | Lec/Lab (3 Credits)**

Analyze a sequence of construction tasks using network diagrams, Gantt charts, and the critical path method to create a project schedule.

**Prerequisite(s):** CMGT1131

**ECDM2301 | Advanced Topics & Technology | Lecture (3 Credits)**

Building on the design theory and labs, in depth analysis of specific electrical design applications, such as residential, medical, data centers, industrial, and other construction. Examine emerging technologies, such as renewable energy and building automation.

**Prerequisite(s):** ELEC1111

**ECDM2302 | Design Capstone | Laboratory (3 Credits)**

Integration of all aspects of electrical construction design and management, including drafting, designing, estimating, and managing projects, to create a complete comprehensive capstone project. The capstone project is presented and reviewed by industry experts and leaders, providing valuable feedback from their own experiences.

**Prerequisite(s):** ECDM2102 And ECDM2202

**ECDM2303 | ECDM Co-op/Internship | Directed Study (3 Credits)**

The Co-op or Internship course allows students to gain credit for work experience. In either option, students must have faculty approval before registering for this course. The Co-op Track is an educational experience combining academic and career interests with industry experience, offering the opportunity to test career interests, such as design, estimating, or project management. Students are paired with one or two companies over the course of a semester. Through the Co-op Option students are empowered to create a career plan enabling them to make well-informed choices for early career success. The Internship Track is a work experience in a typical company scenario. Students work on real and current projects that allow them to explore the difference in scope and types of work that exist outside the academic classroom.

**Prerequisite(s):** ECDM2102 And ECDM2203

**CSBT2110 | Building Codes | Lecture (3 Credits)**

Select and apply appropriate federal, state/provincial and municipal codes, standards and accessibility guidelines using industry standards with an emphasis on Life Safety Codes and the ADA to prepare for licensing exams, meet with codes officials, and to design spaces that enhance the health, safety and welfare of the general public.

**CMGT1313 | Construction Contracts | Lecture (1 Credit)**

Introduction to construction administration documents, systems, and procedures to understand the construction contracting process including planning and scheduling the job, bidding through closeout to meet project requirements.

**MATH1500 | Algebra, Trig & Boolean Algebra | Lecture (5 Credits)**

Polynomials, proportions and linear equations. Trig functions, graphs, and vectors. Binary, octal and hexadecimal number systems. Boolean Algebra and mapping.

**General Education:** Mathematics

## Facilities Operations & Management (FOPS), AAS

The Facilities Operations & Management program prepares graduates for a career in managing the complex, networked buildings and facilities that are part of the modern built environment. Graduates gain expertise in building systems and operations, stakeholder relationships and communications, preventative and predictive maintenance, and project management. This approach is designed so graduates are able to pursue a variety of career paths in the facility management industry, including asset management, technologies that interconnect building safety and

security for the well being of occupants, and management of energy and space. Every building is different and requires a unique set of skills to manage the property. Dunwoody's coursework focuses on a broad spectrum of topics in operations, property maintenance, electrical and mechanical systems, environmental health, and facilities management. Integrated throughout the curriculum is the concept of "Smart Buildings"—how to collect information from building systems, make decisions based on data, and best deploy resources. The Dunwoody campus is used as a living laboratory where students gain real experience in developing awareness and applying best practices to new, existing, and historic building systems and grounds. Environmental sustainability is woven throughout all of the classes so students apply sustainable concepts to all areas of the facility management industry. Students learn to use a variety of software programs, including computerized maintenance management systems (CMMS), REVIT and SketchUp for computer-aided design, integrated workforce management systems (IWMS), and building monitoring systems which provide intelligent data for implementing sustainable solutions. In their first semester, students earn their OSHA30 General Industry card, EPA Section 608 certification, and are prepared to sit for the Minnesota Special Engineers license (boiler exam). Students are also prepared in further semesters to pursue additional certifications such as the International Facility Management Association's Facility Management Professional (FMP) certification, Professional Facility Management Institute's ProFM credential, or Building Owners & Managers Institute (BOMI) International's Facilities Management Administrator (FMA) designation. Dunwoody's program has been designed consistent with the International Facilities Management Association's (IFMA) Facilities Management Accreditation Commission (FMAC) associate degree program standards and is planning to seek program accreditation.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening and Blended

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** IFMA's FMAC, soon to be ABET

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Demonstrate the ability to triage (assess, isolate, stabilize, evaluate and escalate) a wide variety of interconnected mechanical, electrical, and plumbing systems.
- Demonstrate time management strategies to prioritize the immediate needs of the facility.
- Demonstrate safe and proper use of tools, personal protection equipment, and on the job safety relating to each system.
- Demonstrate essential skills needed for preventive maintenance, repair, or installation.
- Interface with building management software.
- Demonstrate the concepts of leadership, customer service, planning, and project management.
- Understand Facilities Management history, practice, sectors and profession in a societal and global context.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
COMM1030	Project Communication	3
COMM1150	Interpersonal Communication	3
HUMN2400	Ethics	2
HUMN3600	Critical & Creative Thinking	3
MATH1050	Algebra, Trigonometry & Geometry	3
Social Sciences		3
Natural Science with Lab		3
<b>Technical Requirements</b>		
CSBT1000	AEC Seminar	1
ARCH1104	Building Systems	3
FMGT1000	Introduction to Facilities	2
FMGT1300	Occupational Safety & Health	2
FMGT1400	Facility Programming & Design	3
FMGT1700	Special Engineer License Prep	1
ARCH1204	Structure & Envelope	3
FMGT1100	Building Operations	3
FMGT1200	MEP Systems: Electrical	3
ARCH2104	Building Service Systems	3
FMGT2100	Property Maintenance	3
FMGT2110	MEP Systems: HVAC&R	3
ARCH2204	Building Envelope & Environment	3
FMGT2210	Smart Buildings I	3
FMGT2200	Facility Operations/Management Capstone	3
<b>Technical Elective (Choose one course):</b>		1
FMGT2011	Facility Operations & Management Topics	
FMGT2010	Second Class Engineer License Prep	
CMGT1901	International AEC Fields & Practices	
Total Credits		60

## Sample Academic Plan

## Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CSBT1000	AEC Seminar	1
ARCH1104	Building Systems	3
FMGT1000	Introduction to Facilities	2
FMGT1300	Occupational Safety & Health	2
FMGT1400	Facility Programming & Design	3
FMGT1700	Special Engineer License Prep	1

COMM1150	Interpersonal Communication	3
Credits		15
Total Credits		15

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ARCH1204	Structure & Envelope	3
FMGT1100	Building Operations	3
FMGT1200	MEP Systems: Electrical	3
MATH1050	Algebra, Trigonometry & Geometry	3
HUMN2400	Ethics	2
Credits		14
Total Credits		14

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
COMM1030	Project Communication	3
HUMN3600	Critical & Creative Thinking	3
ARCH2104	Building Service Systems	3
FMGT2100	Property Maintenance	3
FMGT2110	MEP Systems: HVAC&R	3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
ARCH2204	Building Envelope & Environment	3
FMGT2210	Smart Buildings I	3
FMGT2200	Facility Operations/Management Capstone	3
FMGT2010 or FMGT2011 or CMGT1901	Second Class Engineer License Prep or Facility Operations & Management Topics or International AEC Fields & Practices	1
Natural Sciences with Lab		3
Social Sciences		3
Credits		16
Total Credits		16

## Courses

### Course Descriptions

#### CSBT1000 | AEC Seminar | Seminar (1 Credit)

Introduction to the academic and classroom culture. Develop a proficiency in communication skills including research, oral presentation, writing, and collaboration.

#### ARCH1104 | Building Systems | Lecture (3 Credits)

Examine primary building systems and their associative materials and assemblies. With a focus on current building systems, analyze existing buildings through photography, physical tours, and diagrammatic drawing to achieve a broad knowledge of primary structural systems.

#### FMGT1000 | Introduction to Facilities | Lecture (2 Credits)

Aspects of the facilities management industry are presented using interviews with practicing professionals, site tours, textbook studies and exploratory reflections to illustrate the many opportunities available as a professional.



**FMGT1300 | Occupational Safety & Health | Lecture (2 Credits)**

Examine the principles of facility safety and identify health hazards based on the Occupational Safety and Health Administration (OSHA) 1910 General Industry Standards and MNOSHA Laws and Rules. Emphasis is on hazard identification, avoidance, and control and prevention to develop strategies to prevent injuries to workers, occupants, and guests. Students successfully completing 30 hours of designated training topics receive an OSHA 30 General Industry card.

**FMGT1400 | Facility Programming & Design | Lec/Lab (3 Credits)**

Techniques for analyzing design program requirements and optimizing space. Develop plans that satisfy programmatic needs and use space efficiently. Examine building codes, fire safety, and barrier-free designs as essential components of laying out a workable interior space. Practice basic drafting techniques on current industry software.

**FMGT1700 | Special Engineer License Prep | Seminar (1 Credit)**

Prepare to pass the Minnesota Special Engineer's license exam. Introduction to both high and low pressure boilers used in steam and hot water heating, high-pressure, high temperature hot water boilers used in heating or process installations, and small mechanical-drive steam turbines. Topics include boiler functions, operations, safety, controls, hot water systems, steam systems, and the identification of boiler fittings. MN Statute 326B.972 requires an individual operating a boiler, steam engine, or steam turbine to hold a license for the grade covering that boiler, steam engine, or steam turbine. Also, preparation for the EPA's Section 608 Technician Certification allowing them to work with and handle refrigerants in common air conditioners and HVAC units. The EPA 608 Technician Certification is required by Section 608 of the Federal Clean Air Act for anyone who maintains, services, repairs, or disposes of equipment that could release ozone depleting refrigerants into the atmosphere.

**ARCH1204 | Structure & Envelope | Lecture (3 Credits)**

Introduction to aspects of building assemblies relative to their energy performance, moisture control, durability, and resource efficiency. Research multiple existing buildings through various means to achieve a broad knowledge of varying strategies for the building structure and envelope.

**FMGT1100 | Building Operations | Lec/Lab (3 Credits)**

Represent the organization's brand experience by providing various services for occupants. Interconnected systems and processes such as shipping and receiving, key management, property grounds, storage strategies, safety, housekeeping standards of care, food service, and waste management are paramount to meet the expectations of guests, tenants, owners, and users.

**FMGT1200 | MEP Systems: Electrical | Lec/Lab (3 Credits)**

Explore electrical theories for a foundational understanding of how an electrical system interacts with a building. Laboratory exercises emphasize troubleshooting processes for electrical circuits and systems. Learn how a facilities team safely maintains and monitors a building's electrical system.

**ARCH2104 | Building Service Systems | Lecture (3 Credits)**

Introduction to the principles of embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, day lighting, artificial lighting and acoustics. Research multiple existing buildings through various means to achieve a broad knowledge of varying environmental systems.

**FMGT2100 | Property Maintenance | Lec/Lab (3 Credits)**

Best practices for efficient and effective triage of maintenance and other occupant requests through work orders. Planning for prescriptive and predictive maintenance of systems. Sustainable solutions and asset management. Laboratory exercises emphasize using and managing related tools and resources for various assets and systems.

**FMGT2110 | MEP Systems: HVAC&R | Lec/Lab (3 Credits)**

Explore mechanical theories for a foundational understanding of heating, ventilating, air conditioning and refrigeration systems. Learn the role of HVAC systems in various types of buildings and the key characteristics that enable effective HVAC system functionality. Laboratory experiments and exercises emphasize troubleshooting processes for HVAC&R systems. Learn how a facilities technician safely maintains a building's HVAC&R equipment and components and monitors the system.

**Prerequisite(s):** FMGT1200

**ARCH2204 | Building Envelope & Environment | Lecture (3 Credits)**

Introduction to the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, conveying systems, security, and fire protection systems. Research multiple existing buildings through various means to achieve a broad knowledge of varying building service systems.

**FMGT2210 | Smart Buildings I | Lec/Lab (3 Credits)**

Explore how we advance the productivity and safety of occupants while improving the operational efficiency of buildings through intelligent, integrated green building technologies. Introduction to a number of systems associated with building automation, energy management, and connectivity to global systems. Laboratory exercises focus on building management systems and interconnected components. Emphasis is on sustainable outcomes by decreasing the carbon footprint of a building.

**Prerequisite(s):** FMGT1200 And FMGT2110

**FMGT2200 | Facility Operations/Management Capstone | Capstone (3 Credits)**

Apply facilities management theories, topics, and applications to a final project. Work consists of a project proposal, development of coordinating documents, and final presentation.

**Prerequisite(s):** COMM1030

**FMGT2010 | Second Class Engineer License Prep | Seminar (1 Credit)**

Prepare to pass the Minnesota Second Class Engineer license exam. Review of low pressure boilers used in steam and hot water heating. Topics include MN license requirements, inspections, documentation, boiler functions, operations, safety, controls, feedwater systems, and the identification of boiler fittings. MN Statute 326B.972 requires an individual operating a boiler, steam engine, or steam turbine to hold a license for the grade covering that boiler, steam engine, or steam turbine. Students must have 1 year of licensed experience to sit for the exam.

**FMGT2011 | Facility Operations & Management Topics | Seminar (1 Credit)**

Presentation and examination of topics in facilities operations and management selected to develop a deeper awareness of current trends, issues, and emerging technologies. Supplemented by readings, discussions and papers.



**CMGT1901 | International AEC Fields & Practices | Travel Study (1 Credit)**

Introduction to the international aspects of architecture, engineering, and construction industries. Emphasis on inter-cultural communication, cultural intelligence, and globalization of technology. Four traditional classroom sessions (held before travel) include lectures, seminar discussions, case studies, participatory activities, and guest speaker presentations. Coursework during travel is primarily experiential based and includes fieldwork, group projects and community based service-learning. Travel expenses are incurred by the student.

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**HUMN2400 | Ethics | Lecture (2 Credits)**

The development of ethical standards as related to the individual, government, business, and society. Current legislation is examined from the perspective of its moral and ethical roots with considerations and standards influencing personal and business decisions.

**General Education:** Diversity

**HUMN3600 | Critical & Creative Thinking | Lecture (3 Credits)**

Explore how critical thinking and creativity intersect through various theories to solve diverse, complex or abstract problems.

**General Education:** Upper Humanities

## Heating & Cooling Service Professional (HCSV), AAS

The Heating Cooling Service Professional program combines course work from the HVACR Systems Servicing and HVAC Installation & Residential Service programs to create an AAS degree. This six semester, three-year program provides graduates seeking employment in the HVACR field with cross functional entry level skills in two distinct areas of expertise in the HVAC community. Students gain the theoretical knowledge and hands-on skills required to safely install, service, and maintain HVACR residential and commercial equipment, controls, and ductwork. Students learn residential system design, mechanical and fuel gas code requirements, sheet metal pattern development and fabrication skills, installation techniques, troubleshooting and repair of residential and commercial HVACR equipment, and maintenance requirements for an energy efficient operation.

In addition, students gain oral and written communication skills, computer literacy, advanced computational skills, customer relations, and critical thinking skills through Arts & Sciences and technical course work.

**Credential Earned:** AAS

**Length of Program:** 3 years (6 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** HVAC Excellence

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Select HVAC & R equipment for a designated application.
- Assess HVAC & R electrical circuits for proper operation.
- Assess HVAC & R mechanical equipment for proper operation.
- Determine proper operation of comfort cooling, high, medium, and low temperature refrigeration equipment.
- Analyze HVAC & R, air, water, steam, and refrigerant systems for proper operation.
- Demonstrate effective customer relation skills.
- Fabricate industries most commonly used fittings.
- Generate HVAC systems on residential and commercial working plans.
- Install industries most commonly used equipment.
- Apply effective safety practices while installing HVAC equipment.
- Complete installation of HVAC equipment according to national, state, and local codes.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1050	Algebra, Trigonometry & Geometry	3
COMM1150	Interpersonal Communication	3
	Communications	3
	Diversity	2
	Humanities	3
	Natural Science	3
	Social Science	3
<b>Technical Requirements</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
HEAT1110	HVAC Ducts & Fittings	2
HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2

SERV2110	Domestic Refrigeration Service	2
SERV2120	Commercial Refrigeration Service I	6
SERV2130	Commercial Refrigeration Service II	2
SERV2140	HVAC Control Concepts	3
SERV2210	HVAC Systems Servicing I	3
SERV2240	HVAC Systems Servicing III	3
SERV2250	Building Systems Operations II	2
Total Credits		93

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student’s schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
Humanities		3
Natural Science		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
HEAT1110	HVAC Ducts & Fittings	2
HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
Communications		3
Social Science		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2
COMM1150	Interpersonal Communication	3
Diversity		2
Credits		18
Total Credits		18

Course	Title	Credits
<b>Third Year</b>		
<b>Fall</b>		
SERV2110	Domestic Refrigeration Service	2
SERV2120	Commercial Refrigeration Service I	6
SERV2130	Commercial Refrigeration Service II	2
SERV2140	HVAC Control Concepts	3
Credits		13
Total Credits		13

Course	Title	Credits
<b>Third Year</b>		
<b>Spring</b>		
SERV2140	HVAC Control Concepts	3
SERV2210	HVAC Systems Servicing I	3
SERV2240	HVAC Systems Servicing III	3
SERV2250	Building Systems Operations II	2
Credits		11
Total Credits		11

## Courses

### Course Descriptions

#### SERV1110 | HVAC Electrical I | Lec/Lab (2 Credits)

Basic electrical terminology and theory. Introduction to simple circuit construction. Basic electrical properties and their effects on circuits. Load capacity for wiring and fuses. Simple circuit diagramming. Theory of electrical generation through magnetism and electromagnetism. Analyzing and testing circuits with various test equipment.

#### SERV1120 | Heating Systems I | Lec/Lab (3 Credits)

Basic fundamentals and terminology pertaining to heat transfer. Thermal environmental science properties. Latent and sensible heat, conduction, convection and radiation. Fundamental psychrometrics. Air distribution, room air movement characteristics and the fundamentals of balancing air systems. Analyzing static, velocity and total pressure along with airflow measurements within ductwork.

#### SERV1130 | Residential Controls I | Lec/Lab (2 Credits)

Introduction to basic environmental controls with an emphasis on theory, application, and practical installation. Principles of Effective Temperature will be applied to various temperature, humidity, and air movement controls. Basic control of secondary circuits including transformers, relays, and contactors used in the operation of heating and cooling equipment. Sketch, diagram, and wire basic secondary control circuits. Job safety.

**Prerequisite(s):** SERV1110

**SERV1140 | Basic Motor Technology | Lec/Lab (3 Credits)**

Theory of magnetism and circuitry as it pertains to the induction motor. Introduction to fundamental types of motors used in the HVAC field. Wiring of various power and control circuits. Introduction to the relay, contactor and motor starter. Motor usage and service problems encountered in the field. Electrical diagramming and schematics. Troubleshooting motor circuits. Motor nomenclature and safety.

**Prerequisite(s):** SERV1110

**SERV1150 | Cooling Systems I | Lec/Lab (3 Credits)**

Basic fundamentals of cooling as it pertains to HVAC&R systems. Gas laws and the principles of the basic refrigeration cycle. Skills pertaining to refrigeration: tubing handling, flaring, swedging, soft and hard soldering and brazing. Introduction to refrigerants and refrigerant management.

**Prerequisite(s):** SERV1120

**SERV1210 | Heating Systems II | Lec/Lab (3 Credits)**

Heat generation as it pertains to residential furnaces. Natural and LP gases. Furnace types, sequence of operation, component identification, ignition types, test equipment and safety. Troubleshooting pertaining to the mechanical operation and the electrical control functions of gas furnaces. Diagnostic skills to meet service problems encountered in the field. Combustion testing and job safety.

**Prerequisite(s):** SERV1110, SERV1130, And SERV1140

**SERV1220 | Cooling Systems II | Lec/Lab (3 Credits)**

Fundamentals of residential air conditioning. Evacuation principles and procedures for deep vacuums. Basic split system air conditioning systems wiring and controls examined and diagrammed in schematics. Refrigerant chemistry examined. Refrigerant recycling, recovery, and management reviewed in accordance with EPA standards. Systematic refrigerant charging procedures determined and validated through hands-on guidance using actual equipment. Basic cooling analysis through psychrometrics and pressure-enthalpy processes. Job safety.

**Prerequisite(s):** SERV1110, SERV1130, SERV1140, And SERV1150

**SERV1230 | HVAC Electrical II | Lec/Lab (2 Credits)**

Introduction to semiconductors and elementary solid-state circuits used in HVACR control circuits. Electrical schematics for HVACR secondary and load circuitry. Fundamental operation and wiring of motor starter secondary and load circuits examined, diagrammed, and wired. Electronic theory applied to electronic air cleaners, electronically commutated motors, and digital temperature controls. Continued application of relays, and contactors developed in lab jobs and servicing situations encountered in the field. Job safety.

**Prerequisite(s):** SERV1110

**SERV1240 | Heating Systems III | Lec/Lab (2 Credits)**

Introduction to forced air, oil burning, and electric furnaces. Evaluation of gas, oil, and electric furnace sequences of operation coupled with combustion analysis. Practice of start up procedures and combustion testing processes. Mechanical and electrical applications using wiring diagrams and schematics. Diagnostic skills of mechanical, combustion, and electrical problems encountered in the field. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1210, And SERV1230

**SERV1250 | Cooling Systems III | Lec/Lab (3 Credits)**

Advanced residential air conditioning and air-to-air heat pump systems. Theory and troubleshooting of heat pumps. Application and operation of air conditioning and heat pump controls examined. Wiring diagrams and schematics examined and evaluated. EPA and R-410a certification test review and exam. Introduction to customer relations skills with a focus on occupational professionalism. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1220, And SERV1230

**HEAT1110 | HVAC Ducts & Fittings | Lec/Lab (2 Credits)**

Development and fabrication of ducts and fittings common to the heating, ventilation, and air conditioning industry, with emphasis on uniform and state code requirements. Methods of connecting ducts and fittings in an air system. Principles of geometric pattern development as it applies to duct construction and application. Multiple uses and care of hand tools common to the industry.

**HEAT1120 | Transitional Fittings | Lec/Lab (3 Credits)**

Focus on transitional fittings where the triangulation method of pattern development is required. Use of direct triangulation, as a short-cut method of layout, is emphasized. Identification, care, adjustment, and maintenance of floor equipment common to the sheet metal industry.

**Prerequisite(s):** HEAT1110

**HEAT1130 | HVAC Trunk-line Construction | Lec/Lab (2 Credits)**

Pattern development, and the fabrication of a scaled-down trunk-line, emphasizing the quality and quantity of work. Usage, construction methods, and installation of various types of dampers.

**Prerequisite(s):** HEAT1110 And HEAT1120

**HEAT1140 | Fundamentals of Pattern Development | Lec/Lab (3 Credits)**

Principles of pattern development as they apply to the layout of round fittings requiring parallel, or radial line methods of pattern development. Fabrication procedures for round fittings, including use of rotary machines for fabricating purposes, riveting, and spot welding. Use, safety, and proper procedures for soldering sheet metal are incorporated.

**Prerequisite(s):** HEAT1110, HEAT1120, And HEAT1130

**HEAT1150 | Advanced Pattern Development | Lec/Lab (3 Credits)**

Advanced theory and application of single, and double-line triangulation in the development of irregular patterns. Use of plan and elevation views in the visualization, and development of irregular objects as well as the procedure for the development of true-length lines seen in the foreshortened mode.

**Prerequisite(s):** HEAT1110, HEAT1120, HEAT1130, And HEAT1140

**HEAT2210 | Welding Fundamentals | Lec/Lab (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Vulcan software for CNC plasma table controllers.

**HEAT2220 | HVAC Design | Lec/Lab (2 Credits)**

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

**HEAT2230 | Residential HVAC Installation | Lec/Lab (6 Credits)**

Installation procedures of residential and small commercial heating, ventilation, and air conditioning systems. Emphasis on the Uniform Mechanical code, and Minnesota State Mechanical, Fuel Gas, and Plumbing code, pertaining to heating, ventilation, and air conditioning installation procedures. Air-handling ducts, venting, combustion and fresh-air ducts requirements. Use of available standard-type fittings; sizing, cutting, and threading of gas pipe as well as installation and code requirement of residential-style gas systems. Installation, setup, and maintenance, of industries most common indoor air quality accessories is included.

**Prerequisite(s):** HEAT2210, HEAT2220, HEAT1110, HEAT1120, HEAT1130, HEAT1140, And HEAT1150

**HEAT2240 | Commercial Blueprint Reading | Lec/Lab (2 Credits)**

Architectural, structural, civil, electrical and mechanical blueprint reading with a major emphasis on heating, ventilation, and air conditioning systems contained within these plans. Duct construction, hangers and dampers evaluated according to specification and SMACNA requirements. Make drawings using AutoCAD: 2-D drafting commands for HVAC drafting.

**SERV2110 | Domestic Refrigeration Service | Lec/Lab (2 Credits)**

The mechanical refrigeration cycle of domestic refrigeration equipment will be analyzed and serviced to provide optimum operation.

Refrigeration system component installation, analysis, check-out, repairs and maintenance. System start-up. Internal and external control troubleshooting and analyzing. Operations of various control systems utilized in high temperature refrigeration. Job safety.

**Prerequisite(s):** SERV1240 And SERV1250

**SERV2120 | Commercial Refrigeration Service I | Lec/Lab (6 Credits)**

Air-cooled and water-cooled refrigeration systems. System component analysis, repair and replacement. Methods of defrost, system start up; internal and external control troubleshooting and analyzing; electrical and electronic-control systems. Mechanical refrigeration cycle trouble shooting. Job safety.

**Prerequisite(s):** SERV2110

**SERV2130 | Commercial Refrigeration Service II | Lec/Lab (2 Credits)**

Process chilled water and supermarket systems control, operation and energy management. Safety, both personal and equipment. Daily operation and preventive maintenance. Hands-on analysis and replacement of refrigeration system components. Analyze refrigeration controls. Screw and centrifugal chiller operation leading to year-round system operation.

**Prerequisite(s):** SERV2120

**SERV2140 | HVAC Control Concepts | Lec/Lab (3 Credits)**

Fundamentals of HVAC control. Formations including pneumatic, electric, electronic, DDC and building energy management systems as they pertain to troubleshooting. Application of control systems of individual room, zone air distribution, variable frequency drives, air handlers, chillers and boilers. Damper control including economizer cycles in conjunction with indoor air quality. Safety, both personal and equipment.

**Prerequisite(s):** SERV2130

**SERV2210 | HVAC Systems Servicing I | Lec/Lab (3 Credits)**

Energy management systems. Interfacing HVAC air handlers with energy sources in heating and cooling modes. Psychrometrics, start up and operation of industrial burners and their controls. System fail safe parameters. Analyzing outdoor air control parameters coordinating between energy efficiencies and desirable indoor air qualities. Make up and exhaust systems. DX and chilled water systems and component operation check out, analysis, repair and replacement. Control modes of various HVAC functions. System start up and check out procedures. Gas and mechanical codes. Safety, both personal and equipment.

**Prerequisite(s):** SERV1240 And SERV1250

**SERV2240 | HVAC Systems Servicing III | Lec/Lab (3 Credits)**

Steam accessories and codes regulating them, with emphasis on the Minnesota Boiler Examination. Hands-on analyzing control systems serving these HVAC systems. Steam systems and components. Constant volume HVAC systems. Blowers, filters, cooling coils, heating coils, air blenders and mixing boxes. Energy management systems. Individual HVAC components sized and selected along with single line designs of constant volume and multi zone systems. Low and high pressure steam, boilers and their systems. Steam/hot water fan coil units. Safety, both personal and equipment.

**Prerequisite(s):** SERV2230

**SERV2250 | Building Systems Operations II | Lec/Lab (2 Credits)**

Start up, check out, troubleshoot, diagnose, repair and replace various HVAC wet and dry systems and components. Roof top unit (RTU) start up and check out. Final check outs of various systems used in commercial installations. Operational reports. Control systems. Energy management systems. Preventive maintenance schedules of HVAC equipment. Plumbing, fire-protection and snow melting systems analyzed. Safety, both personal and equipment.

**Prerequisite(s):** SERV2240

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

## HVAC Installation & Residential Service (HEAT), AAS

The HVAC Installation & Residential Servicing program provides graduates with the entry-level skills and theoretical knowledge needed to install and maintain the safe operation and energy efficiency of residential and light commercial heating, ventilation, and air conditioning systems.

Graduates typically secure jobs as residential, commercial or industrial installers, shop workers, erectors, and service technicians working for existing and new construction HVAC companies. Students learn blueprint reading, load calculations, warm air systems design, mechanical and fuel gas code knowledge, installation techniques, pattern development, and fabrication skills.

Students also learn how to service — troubleshoot and repair — residential and light commercial HVAC systems. In addition to field-related skills, students gain oral and written communication skills, advanced computation skills, customer relations, and critical thinking skills through Arts & Sciences and technical course work. A shorter certificate option is also available.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** HVAC Excellence

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Select HVAC equipment for a designated application.
- Assess HVAC electrical circuits for proper operation.
- Assess HVAC mechanical equipment for proper operation.
- Analyze HVAC air and refrigerant systems for proper operation.
- Fabricate industry's most commonly used fittings.
- Generate HVAC systems on residential and commercial working plans.
- Install industry's most commonly used equipment.
- Apply effective safety practices while installing HVAC equipment.
- Complete installation of HVAC equipment according to national, state, and local codes.
- Demonstrate effective customer relation skills.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
CHEM2000	Introduction to Chemistry	3
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
Diversity		2
Humanities		3
Social Sciences		3
General Electives		3
<b>Technical Requirements</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
HEAT1110	HVAC Ducts & Fittings	2

HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
CHEM2000	Introduction to Chemistry	3
Humanities		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
HEAT1110	HVAC Ducts & Fittings	2
HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
Social Sciences		3
General Electives		3
Credits		19
Total Credits		19



Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2
COMM1150	Interpersonal Communication	3
Diversity		2
	Credits	18
	Total Credits	18

## Courses

### Course Descriptions

#### SERV1110 | HVAC Electrical I | Lec/Lab (2 Credits)

Basic electrical terminology and theory. Introduction to simple circuit construction. Basic electrical properties and their effects on circuits. Load capacity for wiring and fuses. Simple circuit diagramming. Theory of electrical generation through magnetism and electromagnetism. Analyzing and testing circuits with various test equipment.

#### SERV1120 | Heating Systems I | Lec/Lab (3 Credits)

Basic fundamentals and terminology pertaining to heat transfer. Thermal environmental science properties. Latent and sensible heat, conduction, convection and radiation. Fundamental psychrometrics. Air distribution, room air movement characteristics and the fundamentals of balancing air systems. Analyzing static, velocity and total pressure along with airflow measurements within ductwork.

#### SERV1130 | Residential Controls I | Lec/Lab (2 Credits)

Introduction to basic environmental controls with an emphasis on theory, application, and practical installation. Principles of Effective Temperature will be applied to various temperature, humidity, and air movement controls. Basic control of secondary circuits including transformers, relays, and contactors used in the operation of heating and cooling equipment. Sketch, diagram, and wire basic secondary control circuits. Job safety.

**Prerequisite(s):** SERV1110

#### SERV1140 | Basic Motor Technology | Lec/Lab (3 Credits)

Theory of magnetism and circuitry as it pertains to the induction motor. Introduction to fundamental types of motors used in the HVAC field. Wiring of various power and control circuits. Introduction to the relay, contactor and motor starter. Motor usage and service problems encountered in the field. Electrical diagramming and schematics. Troubleshooting motor circuits. Motor nomenclature and safety.

**Prerequisite(s):** SERV1110

#### SERV1150 | Cooling Systems I | Lec/Lab (3 Credits)

Basic fundamentals of cooling as it pertains to HVAC&R systems. Gas laws and the principles of the basic refrigeration cycle. Skills pertaining to refrigeration: tubing handling, flaring, swedging, soft and hard soldering and brazing. Introduction to refrigerants and refrigerant management.

**Prerequisite(s):** SERV1120

#### SERV1210 | Heating Systems II | Lec/Lab (3 Credits)

Heat generation as it pertains to residential furnaces. Natural and LP gases. Furnace types, sequence of operation, component identification, ignition types, test equipment and safety. Troubleshooting pertaining to the mechanical operation and the electrical control functions of gas furnaces. Diagnostic skills to meet service problems encountered in the field. Combustion testing and job safety.

**Prerequisite(s):** SERV1110, SERV1130, And SERV1140

#### SERV1220 | Cooling Systems II | Lec/Lab (3 Credits)

Fundamentals of residential air conditioning. Evacuation principles and procedures for deep vacuums. Basic split system air conditioning systems wiring and controls examined and diagrammed in schematics. Refrigerant chemistry examined. Refrigerant recycling, recovery, and management reviewed in accordance with EPA standards. Systematic refrigerant charging procedures determined and validated through hands-on guidance using actual equipment. Basic cooling analysis through psychrometrics and pressure-enthalpy processes. Job safety.

**Prerequisite(s):** SERV1110, SERV1130, SERV1140, And SERV1150

#### SERV1230 | HVAC Electrical II | Lec/Lab (2 Credits)

Introduction to semiconductors and elementary solid-state circuits used in HVACR control circuits. Electrical schematics for HVACR secondary and load circuitry. Fundamental operation and wiring of motor starter secondary and load circuits examined, diagrammed, and wired. Electronic theory applied to electronic air cleaners, electronically commutated motors, and digital temperature controls. Continued application of relays, and contactors developed in lab jobs and servicing situations encountered in the field. Job safety.

**Prerequisite(s):** SERV1110

#### SERV1240 | Heating Systems III | Lec/Lab (2 Credits)

Introduction to forced air, oil burning, and electric furnaces. Evaluation of gas, oil, and electric furnace sequences of operation coupled with combustion analysis. Practice of start up procedures and combustion testing processes. Mechanical and electrical applications using wiring diagrams and schematics. Diagnostic skills of mechanical, combustion, and electrical problems encountered in the field. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1210, And SERV1230

#### SERV1250 | Cooling Systems III | Lec/Lab (3 Credits)

Advanced residential air conditioning and air-to-air heat pump systems. Theory and troubleshooting of heat pumps. Application and operation of air conditioning and heat pump controls examined. Wiring diagrams and schematics examined and evaluated. EPA and R-410a certification test review and exam. Introduction to customer relations skills with a focus on occupational professionalism. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1220, And SERV1230

#### HEAT1110 | HVAC Ducts & Fittings | Lec/Lab (2 Credits)

Development and fabrication of ducts and fittings common to the heating, ventilation, and air conditioning industry, with emphasis on uniform and state code requirements. Methods of connecting ducts and fittings in an air system. Principles of geometric pattern development as it applies to duct construction and application. Multiple uses and care of hand tools common to the industry.

#### HEAT1120 | Transitional Fittings | Lec/Lab (3 Credits)

Focus on transitional fittings where the triangulation method of pattern development is required. Use of direct triangulation, as a short-cut method of layout, is emphasized. Identification, care, adjustment, and maintenance of floor equipment common to the sheet metal industry.

**Prerequisite(s):** HEAT1110

#### HEAT1130 | HVAC Trunk-line Construction | Lec/Lab (2 Credits)

Pattern development, and the fabrication of a scaled-down trunk-line, emphasizing the quality and quantity of work. Usage, construction methods, and installation of various types of dampers.

**Prerequisite(s):** HEAT1110 And HEAT1120

**HEAT1140 | Fundamentals of Pattern Development | Lec/Lab (3 Credits)**

Principles of pattern development as they apply to the layout of round fittings requiring parallel, or radial line methods of pattern development. Fabrication procedures for round fittings, including use of rotary machines for fabricating purposes, riveting, and spot welding. Use, safety, and proper procedures for soldering sheet metal are incorporated.

**Prerequisite(s):** HEAT1110, HEAT1120, And HEAT1130

**HEAT1150 | Advanced Pattern Development | Lec/Lab (3 Credits)**

Advanced theory and application of single, and double-line triangulation in the development of irregular patterns. Use of plan and elevation views in the visualization, and development of irregular objects as well as the procedure for the development of true-length lines seen in the foreshortened mode.

**Prerequisite(s):** HEAT1110, HEAT1120, HEAT1130, And HEAT1140

**HEAT2210 | Welding Fundamentals | Lec/Lab (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Vulcan software for CNC plasma table controllers.

**HEAT2220 | HVAC Design | Lec/Lab (2 Credits)**

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

**HEAT2230 | Residential HVAC Installation | Lec/Lab (6 Credits)**

Installation procedures of residential and small commercial heating, ventilation, and air conditioning systems. Emphasis on the Uniform Mechanical code, and Minnesota State Mechanical, Fuel Gas, and Plumbing code, pertaining to heating, ventilation, and air conditioning installation procedures. Air-handling ducts, venting, combustion and fresh-air ducts requirements. Use of available standard-type fittings; sizing, cutting, and threading of gas pipe as well as installation and code requirement of residential-style gas systems. Installation, setup, and maintenance, of industries most common indoor air quality accessories is included.

**Prerequisite(s):** HEAT2210, HEAT2220, HEAT1110, HEAT1120, HEAT1130, HEAT1140, And HEAT1150

**HEAT2240 | Commercial Blueprint Reading | Lec/Lab (2 Credits)**

Architectural, structural, civil, electrical and mechanical blueprint reading with a major emphasis on heating, ventilation, and air conditioning systems contained within these plans. Duct construction, hangers and dampers evaluated according to specification and SMACNA requirements. Make drawings using AutoCAD: 2-D drafting commands for HVAC drafting.

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**CHEM2000 | Introduction to Chemistry | Lecture (3 Credits)**

Examine contemporary applications of chemistry in such areas as energy, technology and materials, pollution and waste. Applications illustrate many fundamental concepts in chemistry, such as molecular and electronic structure, mixtures, intermolecular forces, phase behavior, thermodynamics, electrochemistry, kinetics, and equilibria. Current and future global challenges are presented and discussed.

**General Education:** Natural Sciences

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

## HVAC Installation (HEATSM), Certificate

### Overview

The HVAC Installation program provides graduates with the entry-level skills and theoretical knowledge needed to install residential and light commercial heating, ventilation and air conditioning systems. Graduates typically secure jobs as residential, commercial or industrial installers, shop workers, erectors, working for existing and new construction HVAC companies. Students learn blueprint reading, load calculations, warm air systems design, mechanical and fuel gas code knowledge, installation techniques, pattern development and fabrication skills. In addition to field-related skills, students gain oral and written communication skills, advanced computation skills, customer relations, and critical thinking skills through Arts & Sciences and technical course work.

**Credential Earned:** Certificate

**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** HVAC Excellence

### Program Outcomes

#### Program Outcomes:

- Fabricate industries most commonly used fittings.
- Generate HVAC systems on residential and commercial working plans.
- Install industries most commonly used equipment.
- Apply effective safety practices while installing HVAC equipment.
- Complete installation of HVAC equipment according to national, state, and local codes.
- Demonstrate effective customer relation skills.

### Degree Requirements

#### Degree Requirements

Code	Title	Credits
HEAT1110	HVAC Ducts & Fittings	2
HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2
Total Credits		26

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
HEAT1110	HVAC Ducts & Fittings	2
HEAT1120	Transitional Fittings	3
HEAT1130	HVAC Trunk-line Construction	2
HEAT1140	Fundamentals of Pattern Development	3
HEAT1150	Advanced Pattern Development	3
Credits		13
Total Credits		13
<b>Spring</b>		
HEAT2210	Welding Fundamentals	3
HEAT2220	HVAC Design	2
HEAT2230	Residential HVAC Installation	6
HEAT2240	Commercial Blueprint Reading	2
Credits		13
Total Credits		13

## Courses

### Course Descriptions

#### HEAT1110 | HVAC Ducts & Fittings | Lec/Lab (2 Credits)

Development and fabrication of ducts and fittings common to the heating, ventilation, and air conditioning industry, with emphasis on uniform and state code requirements. Methods of connecting ducts and fittings in an air system. Principles of geometric pattern development as it applies to duct construction and application. Multiple uses and care of hand tools common to the industry.

#### HEAT1120 | Transitional Fittings | Lec/Lab (3 Credits)

Focus on transitional fittings where the triangulation method of pattern development is required. Use of direct triangulation, as a short-cut method of layout, is emphasized. Identification, care, adjustment, and maintenance of floor equipment common to the sheet metal industry.

**Prerequisite(s):** HEAT1110

#### HEAT1130 | HVAC Trunk-line Construction | Lec/Lab (2 Credits)

Pattern development, and the fabrication of a scaled-down trunk-line, emphasizing the quality and quantity of work. Usage, construction methods, and installation of various types of dampers.

**Prerequisite(s):** HEAT1110 And HEAT1120

#### HEAT1140 | Fundamentals of Pattern Development | Lec/Lab (3 Credits)

Principles of pattern development as they apply to the layout of round fittings requiring parallel, or radial line methods of pattern development. Fabrication procedures for round fittings, including use of rotary machines for fabricating purposes, riveting, and spot welding. Use, safety, and proper procedures for soldering sheet metal are incorporated.

**Prerequisite(s):** HEAT1110, HEAT1120, And HEAT1130

#### HEAT1150 | Advanced Pattern Development | Lec/Lab (3 Credits)

Advanced theory and application of single, and double-line triangulation in the development of irregular patterns. Use of plan and elevation views in the visualization, and development of irregular objects as well as the procedure for the development of true-length lines seen in the foreshortened mode.

**Prerequisite(s):** HEAT1110, HEAT1120, HEAT1130, And HEAT1140

#### HEAT2210 | Welding Fundamentals | Lec/Lab (3 Credits)

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Vulcan software for CNC plasma table controllers.

#### HEAT2220 | HVAC Design | Lec/Lab (2 Credits)

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

#### HEAT2230 | Residential HVAC Installation | Lec/Lab (6 Credits)

Installation procedures of residential and small commercial heating, ventilation, and air conditioning systems. Emphasis on the Uniform Mechanical code, and Minnesota State Mechanical, Fuel Gas, and Plumbing code, pertaining to heating, ventilation, and air conditioning installation procedures. Air-handling ducts, venting, combustion and fresh-air ducts requirements. Use of available standard-type fittings; sizing, cutting, and threading of gas pipe as well as installation and code requirement of residential-style gas systems. Installation, setup, and maintenance, of industries most common indoor air quality accessories is included.

**Prerequisite(s):** HEAT2210, HEAT2220, HEAT1110, HEAT1120, HEAT1130, HEAT1140, And HEAT1150

#### HEAT2240 | Commercial Blueprint Reading | Lec/Lab (2 Credits)

Architectural, structural, civil, electrical and mechanical blueprint reading with a major emphasis on heating, ventilation, and air conditioning systems contained within these plans. Duct construction, hangers and dampers evaluated according to specification and SMACNA requirements. Make drawings using AutoCAD: 2-D drafting commands for HVAC drafting.

## HVACR Systems Servicing (SERV), AAS

The HVACR Systems Servicing program prepares graduates to secure employment as technicians who maintain the safe operation and energy efficiency of residential, light, and large-scale commercial and industrial Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) systems. Modern HVACR systems consist of multiple mechanical, electrical, energy management, and electronic components to operate and drive the equipment. Students learn the skills and theoretical knowledge needed to maintain these operating systems as well as

troubleshoot, diagnose, and correctly repair environmental and product cooling systems.

In addition to field-related skills, students gain oral and written communication skills, advanced computation skills, customer relations, and critical thinking skills through Arts & Sciences and technical course work.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** HVAC Excellence

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Select HVAC & R equipment for a designated application.
- Assess HVAC & R electrical circuits for proper operation.
- Assess HVAC & R mechanical equipment for proper operation.
- Determine proper operation of comfort cooling, high, medium, and low temperature refrigeration equipment.
- Analyze HVAC & R air, water, steam, and refrigerant systems for proper operation.
- Demonstrate effective customer relation skills.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
CHEM2000	Introduction to Chemistry	3
COMM1150	Interpersonal Communication	3
MATH1050	Algebra, Trigonometry & Geometry	3
Diversity		2
Humanities		3
Social Sciences		3
General Electives		3
<b>Technical Requirements</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
SERV2110	Domestic Refrigeration Service	2
SERV2120	Commercial Refrigeration Service I	6
SERV2130	Commercial Refrigeration Service II	2
SERV2140	HVAC Control Concepts	3
SERV2210	HVAC Systems Servicing I	3

HEAT2220	HVAC Design	2
SERV2231	Welding Fundamentals & Sheet Metal	3
SERV2240	HVAC Systems Servicing III	3
SERV2250	Building Systems Operations II	2
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
SERV1110	HVAC Electrical I	2
SERV1120	Heating Systems I	3
SERV1130	Residential Controls I	2
SERV1140	Basic Motor Technology	3
SERV1150	Cooling Systems I	3
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
SERV1210	Heating Systems II	3
SERV1220	Cooling Systems II	3
SERV1230	HVAC Electrical II	2
SERV1240	Heating Systems III	2
SERV1250	Cooling Systems III	3
CHEM2000	Introduction to Chemistry	3
Humanities		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
SERV2110	Domestic Refrigeration Service	2
SERV2120	Commercial Refrigeration Service I	6
SERV2130	Commercial Refrigeration Service II	2
SERV2140	HVAC Control Concepts	3
Social Sciences		3
General Electives		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
SERV2210	HVAC Systems Servicing I	3
HEAT2220	HVAC Design	2
SERV2231	Welding Fundamentals & Sheet Metal	3



SERV2240	HVAC Systems Servicing III	3
SERV2250	Building Systems Operations II	2
COMM1150	Interpersonal Communication	3
Diversity		2
Credits		18
Total Credits		18

## Courses

### Course Descriptions

#### SERV1110 | HVAC Electrical I | Lec/Lab (2 Credits)

Basic electrical terminology and theory. Introduction to simple circuit construction. Basic electrical properties and their effects on circuits. Load capacity for wiring and fuses. Simple circuit diagramming. Theory of electrical generation through magnetism and electromagnetism. Analyzing and testing circuits with various test equipment.

#### SERV1120 | Heating Systems I | Lec/Lab (3 Credits)

Basic fundamentals and terminology pertaining to heat transfer. Thermal environmental science properties. Latent and sensible heat, conduction, convection and radiation. Fundamental psychrometrics. Air distribution, room air movement characteristics and the fundamentals of balancing air systems. Analyzing static, velocity and total pressure along with airflow measurements within ductwork.

#### SERV1130 | Residential Controls I | Lec/Lab (2 Credits)

Introduction to basic environmental controls with an emphasis on theory, application, and practical installation. Principles of Effective Temperature will be applied to various temperature, humidity, and air movement controls. Basic control of secondary circuits including transformers, relays, and contactors used in the operation of heating and cooling equipment. Sketch, diagram, and wire basic secondary control circuits. Job safety.

**Prerequisite(s):** SERV1110

#### SERV1140 | Basic Motor Technology | Lec/Lab (3 Credits)

Theory of magnetism and circuitry as it pertains to the induction motor. Introduction to fundamental types of motors used in the HVAC field. Wiring of various power and control circuits. Introduction to the relay, contactor and motor starter. Motor usage and service problems encountered in the field. Electrical diagramming and schematics. Troubleshooting motor circuits. Motor nomenclature and safety.

**Prerequisite(s):** SERV1110

#### SERV1150 | Cooling Systems I | Lec/Lab (3 Credits)

Basic fundamentals of cooling as it pertains to HVAC&R systems. Gas laws and the principles of the basic refrigeration cycle. Skills pertaining to refrigeration: tubing handling, flaring, swedging, soft and hard soldering and brazing. Introduction to refrigerants and refrigerant management.

**Prerequisite(s):** SERV1120

#### SERV1210 | Heating Systems II | Lec/Lab (3 Credits)

Heat generation as it pertains to residential furnaces. Natural and LP gases. Furnace types, sequence of operation, component identification, ignition types, test equipment and safety. Troubleshooting pertaining to the mechanical operation and the electrical control functions of gas furnaces. Diagnostic skills to meet service problems encountered in the field. Combustion testing and job safety.

**Prerequisite(s):** SERV1110, SERV1130, And SERV1140

#### SERV1220 | Cooling Systems II | Lec/Lab (3 Credits)

Fundamentals of residential air conditioning. Evacuation principles and procedures for deep vacuums. Basic split system air conditioning systems wiring and controls examined and diagrammed in schematics. Refrigerant chemistry examined. Refrigerant recycling, recovery, and management reviewed in accordance with EPA standards. Systematic refrigerant charging procedures determined and validated through hands-on guidance using actual equipment. Basic cooling analysis through psychrometrics and pressure-enthalpy processes. Job safety.

**Prerequisite(s):** SERV1110, SERV1130, SERV1140, And SERV1150

#### SERV1230 | HVAC Electrical II | Lec/Lab (2 Credits)

Introduction to semiconductors and elementary solid-state circuits used in HVACR control circuits. Electrical schematics for HVACR secondary and load circuitry. Fundamental operation and wiring of motor starter secondary and load circuits examined, diagrammed, and wired. Electronic theory applied to electronic air cleaners, electronically commutated motors, and digital temperature controls. Continued application of relays, and contactors developed in lab jobs and servicing situations encountered in the field. Job safety.

**Prerequisite(s):** SERV1110

#### SERV1240 | Heating Systems III | Lec/Lab (2 Credits)

Introduction to forced air, oil burning, and electric furnaces. Evaluation of gas, oil, and electric furnace sequences of operation coupled with combustion analysis. Practice of start up procedures and combustion testing processes. Mechanical and electrical applications using wiring diagrams and schematics. Diagnostic skills of mechanical, combustion, and electrical problems encountered in the field. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1210, And SERV1230

#### SERV1250 | Cooling Systems III | Lec/Lab (3 Credits)

Advanced residential air conditioning and air-to-air heat pump systems. Theory and troubleshooting of heat pumps. Application and operation of air conditioning and heat pump controls examined. Wiring diagrams and schematics examined and evaluated. EPA and R-410a certification test review and exam. Introduction to customer relations skills with a focus on occupational professionalism. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1220, And SERV1230

#### SERV2110 | Domestic Refrigeration Service | Lec/Lab (2 Credits)

The mechanical refrigeration cycle of domestic refrigeration equipment will be analyzed and serviced to provide optimum operation. Refrigeration system component installation, analysis, check-out, repairs and maintenance. System start-up. Internal and external control troubleshooting and analyzing. Operations of various control systems utilized in high temperature refrigeration. Job safety.

**Prerequisite(s):** SERV1240 And SERV1250

#### SERV2120 | Commercial Refrigeration Service I | Lec/Lab (6 Credits)

Air-cooled and water-cooled refrigeration systems. System component analysis, repair and replacement. Methods of defrost, system start up; internal and external control troubleshooting and analyzing; electrical and electronic-control systems. Mechanical refrigeration cycle trouble shooting. Job safety.

**Prerequisite(s):** SERV2110



**SERV2130 | Commercial Refrigeration Service II | Lec/Lab (2 Credits)**

Process chilled water and supermarket systems control, operation and energy management. Safety, both personal and equipment. Daily operation and preventive maintenance. Hands-on analysis and replacement of refrigeration system components. Analyze refrigeration controls. Screw and centrifugal chiller operation leading to year-round system operation.

**Prerequisite(s):** SERV2120

**SERV2140 | HVAC Control Concepts | Lec/Lab (3 Credits)**

Fundamentals of HVAC control. Formations including pneumatic, electric, electronic, DDC and building energy management systems as they pertain to troubleshooting. Application of control systems of individual room, zone air distribution, variable frequency drives, air handlers, chillers and boilers. Damper control including economizer cycles in conjunction with indoor air quality. Safety, both personal and equipment.

**Prerequisite(s):** SERV2130

**SERV2210 | HVAC Systems Servicing I | Lec/Lab (3 Credits)**

Energy management systems. Interfacing HVAC air handlers with energy sources in heating and cooling modes. Psychrometrics, start up and operation of industrial burners and their controls. System fail safe parameters. Analyzing outdoor air control parameters coordinating between energy efficiencies and desirable indoor air qualities. Make up and exhaust systems. DX and chilled water systems and component operation check out, analysis, repair and replacement. Control modes of various HVAC functions. System start up and check out procedures. Gas and mechanical codes. Safety, both personal and equipment.

**Prerequisite(s):** SERV1240 And SERV1250

**HEAT2220 | HVAC Design | Lec/Lab (2 Credits)**

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

**SERV2231 | Welding Fundamentals & Sheet Metal | Lec/Lab (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Fabrication of ductwork and fittings common to the HVAC industry; emphasis on SMACNA and ASHRAE standards.

**SERV2240 | HVAC Systems Servicing III | Lec/Lab (3 Credits)**

Steam accessories and codes regulating them, with emphasis on the Minnesota Boiler Examination. Hands-on analyzing control systems serving these HVAC systems. Steam systems and components. Constant volume HVAC systems. Blowers, filters, cooling coils, heating coils, air blenders and mixing boxes. Energy management systems. Individual HVAC components sized and selected along with single line designs of constant volume and multi zone systems. Low and high pressure steam, boilers and their systems. Steam/hot water fan coil units. Safety, both personal and equipment.

**Prerequisite(s):** SERV2230

**SERV2250 | Building Systems Operations II | Lec/Lab (2 Credits)**

Start up, check out, troubleshoot, diagnose, repair and replace various HVAC wet and dry systems and components. Roof top unit (RTU) start up and check out. Final check outs of various systems used in commercial installations. Operational reports. Control systems. Energy management systems. Preventive maintenance schedules of HVAC equipment. Plumbing, fire-protection and snow melting systems analyzed. Safety, both personal and equipment.

**Prerequisite(s):** SERV2240

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**CHEM2000 | Introduction to Chemistry | Lecture (3 Credits)**

Examine contemporary applications of chemistry in such areas as energy, technology and materials, pollution and waste. Applications illustrate many fundamental concepts in chemistry, such as molecular and electronic structure, mixtures, intermolecular forces, phase behavior, thermodynamics, electrochemistry, kinetics, and equilibria. Current and future global challenges are presented and discussed.

**General Education:** Natural Sciences

**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

## Interior Design (IDSN), Bachelor of Science

The Interior Design program provides a professional, applied education with an emphasis on collaboration, critical thinking, and technology. The faculty is comprised of working professionals who are passionate about the field of design as well as student success. Students use design theories, interior materials, building codes, cost analysis, and both hand and computer-aided drafting to develop and prepare functional and innovative designs for residential and commercial projects.

On-campus design studios foster an engaging environment where creative problem solving is emphasized. Students participate in cross-disciplinary design charrettes with their design and construction peers. This holistic, career-based approach prepares the student to be a productive, successful professional. The Interior Design program is a four-year Bachelor of Science degree program accredited by the Council for Interior Design Accreditation.

**Credential Earned:** BS

**Length of Program:** 4 years (8 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

**Accreditation:** CIDA (Council of Interior Design)

## Program Outcomes

### Program Outcomes:

- Global Context - Interior designers have a global view and consider social, cultural, economic, and ecological contexts in all aspects of their work.
- Collaboration - Interior designers collaborate and also participate in interdisciplinary teams.
- Business Practices and Professionalism - Interior designers understand the principles and processes that define the profession and the value of interior design to society.
- Human-Centered Design - Interior designers apply knowledge of human experience and behavior to designing the built environment.

- Design Process - Interior designers employ all aspects of the design process to creatively solve a design problem.
- Communication - Interior designers are effective communicators.
- History - Interior designers apply knowledge of history of interiors, architecture, decorative arts, art, and related theories when solving design problems.
- Design Elements and Principles - Interior designers apply elements and principles of design.
- Light and Color - Interior designers apply the principles and theories of light and color effectively in relation to environmental impact and human well-being.
- Products and Materials - Interior designers complete design solutions that integrate furnishings, products, materials, and finishes.
- Environmental Systems and Comfort - Interior designers use the principles of acoustics, thermal comfort, and indoor air quality in relation to environmental impact and human well-being.
- Construction - Interior designers understand interior construction and its interrelationship with base building construction and systems.
- Regulations and Guidelines - Interior designers apply laws, codes, standards, and guidelines that impact human experience of interior spaces.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
Diversity		2
English		3
Humanities		3
Mathematics		3
Natural Sciences		3
Psychology		3
Upper Communications		2
Upper Humanities		6
Upper Social Sciences		5
<b>Technical Requirements</b>		
IDSN1111	Basic Drafting & AutoCAD	3
IDSN1120	Interior Design Careers	1
IDSN1130	Color, Light & Design Fundamentals	3
IDSN1140	Creative Thinking	2
IDSN1210	Freshman Studio	4
IDSN1230	Materials & Textiles	3
IDSN1240	Presentation Skills I	3
CSBT2110	Building Codes	3
IDSN2111	Studio 1	4
IDSN2140	Lighting	2
ARCH1104	Building Systems	3
IDSN2220	Presentation Skills II	3
ARCH3203	History of Architecture I	3
IDSN2200	Global Design	3
IDSN2210	Studio 2	5
IDSN3120	Revit for Interior Design	3
IDSN3160	3D Design Ideation	2
ARCH4104	History of Architecture II	3

IDSN3110	Studio 3	5
IDSN3170	History of Interiors	2
IDSN3230	Project Management	2
IDSN3141	Evidence Based Design	1
IDSN3150	Interior Design Seminar	1
IDSN3210	Studio 4	5
IDSN3220	Interior Design Portfolio	2
IDSN3240	LEED	1
IDSN4120	Internship for Interior Design	2
IDSN4110	Studio 5	5
IDSN4140	Furniture Design	3
IDSN4211	Capstone for Interior Design	7
IDSN4221	Business Practices	1
Total Credits		120

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

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Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
IDSN1111	Basic Drafting & AutoCAD	3
IDSN1120	Interior Design Careers	1
IDSN1130	Color, Light & Design Fundamentals	3
IDSN1140	Creative Thinking	2
English		3
Humanities		3
Credits		15
Total Credits		15

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
IDSN1210	Freshman Studio	4
IDSN1230	Materials & Textiles	3
IDSN1240	Presentation Skills I	3
CSBT2110	Building Codes	3
Psychology		3
Credits		16
Total Credits		16

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
IDSN2111	Studio 1	4
IDSN2140	Lighting	2
ARCH1104	Building Systems	3
IDSN2220	Presentation Skills II	3
ARCH3203	History of Architecture I	3

Upper Communications	2
Credits	17
Total Credits	17

Upper Humanities	3
Credits	11
Total Credits	11

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
IDSN2200	Global Design	3
IDSN2210	Studio 2	5
IDSN3120	Revit for Interior Design	3
IDSN3160	3D Design Ideation	2
ARCH4104	History of Architecture II	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>Third Year</b>		
<b>Fall</b>		
IDSN3110	Studio 3	5
IDSN3170	History of Interiors	2
IDSN3230	Project Management	2
Upper Humanities		3
Upper Social Sciences		2
Credits		14
Total Credits		14

Course	Title	Credits
<b>Third Year</b>		
<b>Spring</b>		
IDSN3141	Evidence Based Design	1
IDSN3150	Interior Design Seminar	1
IDSN3210	Studio 4	5
IDSN3210	Studio 4	5
IDSN3220	Interior Design Portfolio	2
IDSN3240	LEED	1
Mathematics		3
Upper Social Sciences		3
Credits		21
Total Credits		21

Course	Title	Credits
<b>Third Year</b>		
<b>Summer</b>		
IDSN4120	Internship for Interior Design	2
Credits		2
Total Credits		2

Course	Title	Credits
<b>Fourth Year</b>		
<b>Fall</b>		
IDSN4110	Studio 5	5
IDSN4140	Furniture Design	3
Diversity		2
Natural Sciences		3
Credits		13
Total Credits		13

Course	Title	Credits
<b>Fourth Year</b>		
<b>Spring</b>		
IDSN4211	Capstone for Interior Design	7
IDSN4221	Business Practices	1

## Courses

### Course Descriptions

#### IDSN1111 | Basic Drafting & AutoCAD | Lecture (3 Credits)

Basic hand drafting, Computer Aided Drafting, and design skills necessary to complete the drafting process of any given space using hand drafting equipment, plan reading, typical plan symbols and nomenclature to create appropriate line quality, architectural symbols and lettering, electrical symbols, elevations and sections. Emphasis is on architectural applications and building components utilized for Interior Design.

#### IDSN1120 | Interior Design Careers | Lecture (1 Credit)

Survey of the variety of career paths available using field trips, guest speakers, and research to differentiate the types of design practice.

#### IDSN1130 | Color, Light & Design Fundamentals | Lecture (3 Credits)

Explain hue, value, and intensity of color using color systems theories, and principles to evaluate the dynamics of color and light in interior space, what color is, why it happens, and how it is controlled. Elements of design (line, shape, texture, illusion of space, illusion of motion), and design principles (unity, emphasis, scale, balance, and rhythm) are applied in two- and three-dimensional projects to create a foundation for all future design decisions.

#### IDSN1140 | Creative Thinking | Lecture (2 Credits)

Utilize critical listening skills, mind/body connection to creativity, and the balance between the left and right side of the brain following the continuum of imagination, creation, and innovation through experiential group and individual projects to get a new idea, act on the idea, and create the next great thing.

#### IDSN1210 | Freshman Studio | Studio (4 Credits)

Apply the basic skills necessary to design interior spaces in a home using the typical industry design phases including programming, schematic design, and design development. Concept development, space planning, material and FF&E (Furnishings, Fixtures, and Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN1111 And IDSN1130

#### IDSN1230 | Materials & Textiles | Lecture (3 Credits)

Analyze materials and textiles for durability, biohazards, ease of use, life-cycle cost, sustainability, safety, and performance. Using an in-depth analysis of fiber, textile manufacturing, identification of yarns, weaves, finishing, and engineering to select end uses, and to understand the codes that apply to their use. Complete take-off calculations for fabric, wallcoverings, floor finish materials, and paint.

#### IDSN1240 | Presentation Skills I | Lecture (3 Credits)

The basics of graphics, methods and techniques, craftsmanship, and model making are applied with the necessary tools of presentation for communicating visually and verbally with a client.

**Prerequisite(s):** IDSN1110

#### CSBT2110 | Building Codes | Lecture (3 Credits)

Select and apply appropriate federal, state/provincial and municipal codes, standards and accessibility guidelines using industry standards with an emphasis on Life Safety Codes and the ADA to prepare for licensing exams, meet with codes officials, and to design spaces that enhance the health, safety and welfare of the general public.

**IDSN2111 | Studio 1 | Studio (4 Credits)**

Apply the basic skills necessary to design interior spaces in a small commercial space with an emphasis on non-profit organizations and small office spaces using the typical design phases including programming, schematic design, and design development. Concept development, space planning, material and FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN1210

**IDSN2140 | Lighting | Lecture (2 Credits)**

Select and specify luminaires and lamp types using principles of good lighting to construct well lit spaces. Emphasis on aesthetic considerations such as function, color rendition, and psychological factors.

**ARCH1104 | Building Systems | Lecture (3 Credits)**

Examine primary building systems and their associative materials and assemblies. With a focus on current building systems, analyze existing buildings through photography, physical tours, and diagrammatic drawing to achieve a broad knowledge of primary structural systems.

**IDSN2220 | Presentation Skills II | Lec/Lab (3 Credits)**

InDesign, Photoshop, and Illustrator are utilized to successfully combine the principles of color, layout, and visual communication with the skills of digital design, hand rendering, and sketching to produce successful and professional presentation drawings, boards, models, and documents.

**ARCH3203 | History of Architecture I | Lecture (3 Credits)**

This survey course introduces students to the world of architecture throughout the history of human settlement up to the modern era. Particular attention is given to the histories of design technologies and building science as well as the evolution of the role of the architect in human civilization.

**IDSN2200 | Global Design | Lecture (3 Credits)**

Conduct interior design practice in a globalized market by studying cultures, mores, and design to make design decisions within the parameters of ecological, socioeconomic and cultural context.

**IDSN2210 | Studio 2 | Studio (5 Credits)**

Apply the intermediate skills necessary to design interior spaces in a home with an emphasis on kitchen and bath using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN2111

**IDSN3120 | Revit for Interior Design | Lec/Lab (3 Credits)**

Advanced CAD drafting processes and procedures for practical application in Interior Design. Projects are modeled in 3D with an emphasis on custom objects or ?families?.

**IDSN3160 | 3D Design Ideation | Lec/Lab (2 Credits)**

Develop understanding of the three dimensional design process through research design, prototype construction, evaluation, and redesign. Increase perception of materiality.

**Prerequisite(s):** IDSN1111 And IDSN1210

**ARCH4104 | History of Architecture II | Lecture (3 Credits)**

This lecture and research course introduces students to architecture of the modern movement up to present day. Critical writings, conceptual design works, current lectures, and building tours will be studied and synthesized so students may gain an individual position on the present and future condition of architectural history.

**IDSN3110 | Studio 3 | Studio (5 Credits)**

Apply the intermediate skills necessary to design interior spaces in a commercial space with an emphasis on corporate and health care using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN2210

**IDSN3170 | History of Interiors | Lecture (2 Credits)**

Differentiate styles of interiors, furniture, and decorative arts from ancient to present time Modern within their political and cultural context using research, field trips, and site visits to inform design decisions.

**IDSN3230 | Project Management | Lecture (2 Credits)**

Principles and techniques for managing construction projects using team building, troubleshooting, site inspections, punch lists, and post-occupancy evaluations to complete a project on time and within budget.

**IDSN3141 | Evidence Based Design | Lecture (1 Credit)**

Gather appropriate information and research findings to solve an interior design problem. APA format is used to produce a technical paper.

**IDSN3150 | Interior Design Seminar | Seminar (1 Credit)**

Prepare for Interior Design Internship which includes resume creation, interview preparation, and job discovery.

**Prerequisite(s):** IDSN3110

**IDSN3210 | Studio 4 | Studio (5 Credits)**

Apply the advanced skills necessary to design interior spaces in a commercial space with an emphasis on hospitality and historic preservation using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN3110

**IDSN3220 | Interior Design Portfolio | Lec/Lab (2 Credits)**

Create portfolio by compiling projects to produce a representative sample of work.

**IDSN3240 | LEED | Lecture (1 Credit)**

An introduction to the processes and procedures associated with LEED certification as well as exam preparation.

**IDSN4120 | Internship for Interior Design | Internship (2 Credits)**

On-the-job training in the interior design industry to facilitate professional growth.

**Prerequisite(s):** IDSN3210

**IDSN4110 | Studio 5 | Studio (5 Credits)**

Complete a project using all phases of the design process, including research, a preliminary budget, presentation, and contract documentation to create a project in a career specialty of interest.

**Prerequisite(s):** IDSN3210

**IDSN4140 | Furniture Design | Lecture (3 Credits)**

Classic to contemporary styles of furnishings from iconic designers. Create an imaginative piece of furniture designed to meet a specific need.

**Prerequisite(s):** IDSN2120 And IDSN2240

**IDSN4211 | Capstone for Interior Design | Capstone (7 Credits)**

Complete a final project using all phases of the design process, including research, a preliminary budget, presentation, and contract documentation to create a project in a career specialty of interest.

**Prerequisite(s):** IDSN4110

**IDSN4221 | Business Practices | Lecture (1 Credit)**

Utilize specific interior design organizational and procedures through case studies, research, and team building to justify ethical and accepted standards of practice or business.

**Prerequisite(s):** IDSN3141 And IDSN3230

## Land Surveying (SURV), Certificate Overview

For students with a bachelor's degree in a related field, Dunwoody's Surveying certificate may provide an avenue to licensure as a Land Surveyor. The certificate offers 22 technical credits in land surveying, as currently required by the MN board of licensure (AELSLAGID). Technical courses include lectures and laboratories in areas such as GPS and geodetic surveying, 2D and 3D drafting, boundary control, and land use planning.

Credits earned in the Land Surveying certificate directly transfer into Dunwoody's Surveying & Civil Engineering Technology (SCVL) (p. 70) associate's degree program.

**Credential Earned:** Certificate

**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

## Program Outcomes

### Program Outcomes:

- Initiate and apply design of entry level complexity.
- Analyze drawings, specifications, surveys and apply industry standards.
- Interpret and review engineering and survey work.
- Analyze surveying and civil engineering principles, practices and techniques.
- Utilize field and office procedures to complete tasks.
- Operate industry software and equipment.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1050	Algebra, Trigonometry & Geometry	3
<b>Technical Requirements</b>		
SCVL1111	Introduction to Surveying	3
CSBT1002	Construction Drafting	3
SCVL1130	Legal Descriptions & Boundary Control	4
<b>Technical Elective (Choose one course):</b>		4

SCVL1210	Control & Geodetic Surveying	
SCVL2210	Laser Scanning & Remote Sensing	
<b>Technical Elective (Choose any course):</b>		4
SCVL1220	Transportation & Municipal Design	
SCVL2120	Utility & Construction Design	
SCVL2260	Site & Subdivision Design	
<b>Technical Elective (Choose one course):</b>		4
SCVL1230	Land Use Planning	
SCVL2250	Geospatial Technology	
<b>Total Credits</b>		25

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
SCVL1111	Introduction to Surveying	3
CSBT1002	Construction Drafting	3
MATH1050	Algebra, Trigonometry & Geometry	3
SCVL1220 or SCVL2120 or SCVL2260	Transportation & Municipal Design or Utility & Construction Design or Site & Subdivision Design	4
<b>Credits</b>		13
<b>Total Credits</b>		13

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
SCVL1210 or SCVL2210	Control & Geodetic Surveying or Laser Scanning & Remote Sensing	4
SCVL1130	Legal Descriptions & Boundary Control	4
SCVL1230 or SCVL2250	Land Use Planning or Geospatial Technology	4
<b>Credits</b>		12
<b>Total Credits</b>		12

## Courses

### Course Descriptions

#### SCVL1111 | Introduction to Surveying | Lec/Lab (3 Credits)

Introduction to the technical equipment and industry processes used by surveying technicians to collect and interpret data.

#### CSBT1002 | Construction Drafting | Lec/Lab (3 Credits)

Implement construction graphics and conventions using hand drafting and drawing software.



**SCVL2140 | SCVL Topics | Seminar (1 Credit)**

Topics in land surveying and civil engineering presented and examined through lectures, speakers, and field trips to develop an awareness of current trends, issues, and the future of the surveying and civil design industries.

**Prerequisite(s):** CSBT1000

**SCVL1130 | Legal Descriptions & Boundary Control | Lecture (4 Credits)**

Introduction to property descriptions and land survey systems with a focus on composing and interpreting legal descriptions used in surveys.

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**SCVL1210 | Control & Geodetic Surveying | Lec/Lab (4 Credits)**

Examine the fundamentals of Control Surveys, including Global Positioning Systems, focus and its' application to the geospatial industries, as well as an in-depth study of datums and projections.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2210 | Laser Scanning & Remote Sensing | Lec/Lab (4 Credits)**

Analyze Laser Scanning and Remote Sensing technology, including the integration of the data to surveying and civil engineering projects.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2240 | Exam Preparation | Seminar (1 Credit)**

Review various categories relevant to certification and licensure exams. Emphasis will be on the topics listed to occur on the exams.

**Prerequisite(s):** SCVL1110, CSBT1000, And SCVL1111

**Corequisite(s):** SCVL1110

**SCVL1001 | Special Topics in Surveying | Directed Study (1 Credit)**

Investigation of a selected topic in various areas of surveying allowing an area of special interest to be further examined. Prerequisite: Proposal and consent of instructor.

**Prerequisite(s):** SCVL1110

**SCVL2000 | Professional Development | Directed Study (2 Credits)**

Develop and implement a customized plan which identifies areas of focus to be a successful graduate. Emphasis is on completion of an internship, professional seminar(s), certification(s), or alternative project.

**Prerequisite(s):** SCVL1110

**SCVL1230 | Land Use Planning | Lecture (4 Credits)**

Introduction to the planning process used to develop land with an emphasis on land use for public and private needs in a community.

**SCVL2250 | Geospatial Technology | Lecture (4 Credits)**

Examine the current state of the Geospatial Industry, including Geographic Information Systems(GIS) and Geospatial products.

**Prerequisite(s):** SCVL1110 And SCVL1111

## Surveying & Civil Engineering Technology (SCVL), AAS

The Surveying & Civil Engineering Technology program prepares students to become technicians in the civil engineering and land surveying industries. Technicians may be employed by governmental agencies including counties, cities, and states. Graduates may also be employed in the private sector by contractors, engineering, or land surveying firms in a wide range of starting positions. Students are prepared to work in the industries of land surveying and civil engineering under a professional surveyor or civil engineer. Surveying technicians assist surveyors in collecting data and making maps of the earth's surface. Surveying

technicians typically work in an office or visit sites to take measurements of the land. Civil engineering technicians help civil engineers plan and design the construction of highways, bridges, utilities, and other major infrastructure projects. They also help with commercial, residential, and land development.

Students are provided with experiences emphasizing surveying, drafting/design, and materials testing. Surveying courses give students the opportunity to learn how to operate industry utilized equipment, including the latest in GNSS (GPS) technology. Survey drawings and engineering plans are developed using enhanced computer-aided drafting programs (CAD). Arts & Sciences courses round out the course of study, providing students with the analytical, communication, and writing skills the industry demands of its professionals. The program prepares students to take the National Society of Professional Surveyors (NSPS) Certified Survey Technician (CST) Level I exam.

For students with a bachelor's degree in a related field, Dunwoody's Surveying certificate may provide an avenue to licensure as a Land Surveyor. The certificate offers 22 technical credits in land surveying, as currently required by the MN board of licensure (AELSLAGID). Technical courses include lectures and laboratories in areas such as GPS and geodetic surveying, 2D and 3D drafting, boundary control, and land use planning.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Bachelor's Completion Option(s):** Construction Management (CMGT), Bachelor of Science (p. 42) | Business Management Leadership (AMGT), Bachelor of Science (p. 42)

## Program Outcomes

### Program Outcomes:

- Initiate and apply design of entry level complexity.
- Analyze drawings, specifications, surveys and apply industry standards.
- Interpret and review engineering and survey work.
- Analyze surveying and civil engineering principles, practices and techniques.
- Utilize field and office procedures to complete tasks.
- Operate industry software and equipment.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1700	Pre Calculus	3
MATH2250	Statistics	3
Communications		3
Humanities		3
Social Sciences		3
General Electives		3
<b>Technical Requirements</b>		
SCVL1111	Introduction to Surveying	3

CSBT1002	Construction Drafting	3
SCVL1130	Legal Descriptions & Boundary Control	4
CSBT1000	AEC Seminar	1
SCVL1210	Control & Geodetic Surveying	4
SCVL1220	Transportation & Municipal Design	4
SCVL1230	Land Use Planning	4
CSBT2000	Professional Development	1
SCVL2111	Materials, Testing, Construction Methods	3
SCVL2120	Utility & Construction Design	4
SCVL2140	SCVL Topics	1
SCVL2210	Laser Scanning & Remote Sensing	4
SCVL2240	Exam Preparation	1
SCVL2250	Geospatial Technology	4
SCVL2260	Site & Subdivision Design	4
<b>Technical Elective</b>		
Choose any Construction Department courses		2
Total Credits		68

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
SCVL1111	Introduction to Surveying	3
CSBT1002	Construction Drafting	3
SCVL1130	Legal Descriptions & Boundary Control	4
CSBT1000	AEC Seminar	1
MATH1050	Algebra, Trigonometry & Geometry	3
Communications		3
Credits		17
Total Credits		17

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
SCVL1210	Control & Geodetic Surveying	4
SCVL1220	Transportation & Municipal Design	4
SCVL1230	Land Use Planning	4
CSBT2000	Professional Development	1
MATH2250	Statistics	3
Social Science		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
SCVL2111	Materials, Testing, Construction Methods	3

SCVL2120	Utility & Construction Design	4
SCVL2140	SCVL Topics	1
Any courses under Construction department		2
MATH1700	Pre Calculus	3
Humanities		3
Credits		16
Total Credits		16
<b>Course Title Credits</b>		
<b>Second Year</b>		
<b>Spring</b>		
SCVL2210	Laser Scanning & Remote Sensing	4
SCVL2240	Exam Preparation	1
SCVL2250	Geospatial Technology	4
SCVL2260	Site & Subdivision Design	4
General Elective		3
Credits		16
Total Credits		16

## Courses

### Course Descriptions

#### SCVL1111 | Introduction to Surveying | Lec/Lab (3 Credits)

Introduction to the technical equipment and industry processes used by surveying technicians to collect and interpret data.

#### CSBT1002 | Construction Drafting | Lec/Lab (3 Credits)

Implement construction graphics and conventions using hand drafting and drawing software.

#### SCVL1130 | Legal Descriptions & Boundary Control | Lecture (4 Credits)

Introduction to property descriptions and land survey systems with a focus on composing and interpreting legal descriptions used in surveys.

#### CSBT1000 | AEC Seminar | Seminar (1 Credit)

Introduction to the academic and classroom culture. Develop a proficiency in communication skills including research, oral presentation, writing, and collaboration.

#### SCVL1210 | Control & Geodetic Surveying | Lec/Lab (4 Credits)

Examine the fundamentals of Control Surveys, including Global Positioning Systems, focus and its' application to the geospatial industries, as well as an in-depth study of datums and projections.

**Prerequisite(s):** SCVL1110 And SCVL1111

#### SCVL1220 | Transportation & Municipal Design | Lec/Lab (4 Credits)

Utilize the principles of civil design with industry software to create elements of transportation and municipal design.

**Prerequisite(s):** CSBT1001 And CSBT1002

#### SCVL1230 | Land Use Planning | Lecture (4 Credits)

Introduction to the planning process used to develop land with an emphasis on land use for public and private needs in a community.

#### CSBT2000 | Professional Development | Seminar (1 Credit)

Apply technical skills in a related industry setting to acquire real world experience in an area of student interest.

#### SCVL2111 | Materials, Testing, Construction Methods | Lec/Lab (3 Credits)

Introduction to testing construction materials and methods, inspection and quality control. Examine construction documents to estimate quantities and costs for civil projects.

**SCVL2120 | Utility & Construction Design | Lec/Lab (4 Credits)**

Utilize the principles of civil design with industry software to create elements of utility infrastructure and its' construction.

**Prerequisite(s):** CSBT1001 And CSBT1002

**SCVL2140 | SCVL Topics | Seminar (1 Credit)**

Topics in land surveying and civil engineering presented and examined through lectures, speakers, and field trips to develop an awareness of current trends, issues, and the future of the surveying and civil design industries.

**Prerequisite(s):** CSBT1000

**SCVL2210 | Laser Scanning & Remote Sensing | Lec/Lab (4 Credits)**

Analyze Laser Scanning and Remote Sensing technology, including the integration of the data to surveying and civil engineering projects.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2240 | Exam Preparation | Seminar (1 Credit)**

Review various categories relevant to certification and licensure exams. Emphasis will be on the topics listed to occur on the exams.

**Prerequisite(s):** SCVL1110, CSBT1000, And SCVL1111

**Corequisite(s):** SCVL1110

**SCVL2250 | Geospatial Technology | Lecture (4 Credits)**

Examine the current state of the Geospatial Industry, including Geographic Information Systems(GIS) and Geospatial products.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2260 | Site & Subdivision Design | Lec/Lab (4 Credits)**

Utilize the principles of civil design with industry software to create elements of site design, including the design of subdivisions and study of the subdivision process.

**Prerequisite(s):** CSBT1001 And CSBT1002

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**MATH2250 | Statistics | Lecture (3 Credits)**

Descriptive and inferential statistics, frequency distributions, probability theory, and issues related to gathering data; computer spreadsheets facilitate the organization, analysis and display of data.

**General Education:** Mathematics

**MATH1700 | Pre Calculus | Lecture (3 Credits)**

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

**General Education:** Mathematics

## Design & Graphics Technology Department

- Graphic Design (GDES), AAS (p. 72)
- Pre-Media Technologies (PREP), AAS (p. 75)

## Graphic Design (GDES), AAS

The Graphic Design program brings out the designer in its students and adds real-world, hands-on skills. Students learn how to take a creative project from concept to completion and are prepared to work in a variety

of creative fields, including marketing, advertising, publishing, and packaging. Career titles of recent graduates include: production artist, graphic designer, web designer, package designer, project manager, and structural package designer.

The program provides instruction in industry standard hardware (Apple OSX) and software (Adobe's Creative Suite including InDesign, Illustrator, Photoshop, Bridge, and Acrobat). Topics covered include color theory and color management, typography, and layout and design. Web design and packaging design are also addressed. Arts & Sciences curriculum both supports the students' technical direction and enhances their oral and written communication skills, fundamental math skills, and critical thinking ability. The course of study culminates in an industry internship or capstone project where the students gain on-the-job experience.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- Operate and maintain equipment safely.
- Diagram graphic workflows.
- Explain various graphics industry segments.
- Prepare documents to industry standards.
- Apply graphics measurement tools.
- Manage color outcomes.
- Demonstrate professional work behavior.
- Create print-based visual communication pieces.
- Create web-based visual communication pieces.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
ARTS1250	History of Design	3
ENGL1010	English	3
Communications		3
Diversity		2
Natural Science/Mathematics		3
Social Science		3
General Electives		3
<b>Technical Requirements</b>		
GAPT1110	Design Principles & Applications	3
GAPT1120	Pre-Media Principles & Applications	3
GAPT1130	21st Century Graphic Communication	3
GAPT1141	Introduction to Web Design	1
GAPT1150	Introduction to Color Theory	1
GAPT1210	Packaging Design	2
GAPT1220	Applied Color Theory	1
GAPT1230	Image Composition & Effects	1
GDES1210	Typography	2
GDES1220	Design for Print	2
CWEB1000	Introduction to Web Languages	2

GDES1231	Vector Design	1
PREP1220	Advanced Image Editing	1
GDES2220	Information Design	2
GAPT2110	Color Management	2
GDES2120	Design for Publication	2
GAPT2120	Web Graphics	2
GDES2210	Business of Design	2
GDES2110	Design for Digital Print	2
GDES2230	Graphic Design Portfolio	1
<b>Technical Elective (Choose one course):</b>		2
PREP2111	Advanced Structural Design	
GDES2140	Design for Animation & Interactivity	
<b>Technical Elective (Choose one course):</b>		4
GAPT2240	Graphic Arts Industry Internship	
GDES2240	Graphic Design Capstone	
Total Credits		62

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
GAPT1110	Design Principles & Applications	3
GAPT1120	Pre-Media Principles & Applications	3
GAPT1130	21st Century Graphic Communication	3
GAPT1141	Introduction to Web Design	1
GAPT1150	Introduction to Color Theory	1
Natural Science/Mathematics		3
Communications		3
Credits		17
Total Credits		17
<b>Second Year</b>		
<b>Spring</b>		
GAPT1210	Packaging Design	2
GAPT1220	Applied Color Theory	1
GAPT1230	Image Composition & Effects	1
GDES1210	Typography	2
GDES1220	Design for Print	2
CWEB1000	Introduction to Web Languages	2
GDES1231	Vector Design	1
PREP1220	Advanced Image Editing	1
ARTS1250	History of Design	3
Diversity		2
Credits		17
Total Credits		17

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
GDES2220	Information Design	2
GAPT2110	Color Management	2
GDES2120	Design for Publication	2
GAPT2120	Web Graphics	2
PREP2111	Advanced Structural Design	2
or GDES2140	or Design for Animation & Interactivity	
ENGL1010	English	3
Social Sciences		3
Credits		16
Total Credits		16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
GDES2210	Business of Design	2
GDES2110	Design for Digital Print	2
GDES2230	Graphic Design Portfolio	1
GAPT2240	Graphic Arts Industry Internship	4
or GDES2240	or Graphic Design Capstone	
General Electives		3
Credits		12
Total Credits		12

## Courses

### Course Descriptions

#### GAPT1110 | Design Principles & Applications | Lec/Lab (3 Credits)

Introduction to design principles and processes, including creative problem solving, design work flows, and industry best practices; includes typography, drawing, layout and composition. Explore Adobe Creative Suite.

#### GAPT1120 | Pre-Media Principles & Applications | Lec/Lab (3 Credits)

Introduction to pre-media principles and processes. Input, edit, output and archive media assets for all possible print and online outcomes. Explore various pre-media workflows, using industry best practices.

#### GAPT1130 | 21st Century Graphic Communication | Lec/Lab (3 Credits)

Introduction to digital and analog print processes, and various bindery and finishing technologies. Prepare and test for Flexographic Technical Association Level One Certification.

#### GAPT1141 | Introduction to Web Design | Laboratory (1 Credit)

Introduction to web design using a graphical user interface web development tool. Basics of HTML and CSS with an emphasis on web design principles and file management.

#### GAPT1150 | Introduction to Color Theory | Lecture (1 Credit)

The importance and power of color in graphic communication, brand identity, and color reproduction. Color psychology, science and applications. Hands-on exploration of RGB, LAB and CMYK color spaces.

#### GAPT1210 | Packaging Design | Lec/Lab (2 Credits)

Investigate the concepts of folding carton design and production for retail and commercial use. Client-driven creation of a custom folding carton from structural design through finished branded prototype and formal presentation. Train on industry standard ArtiosCAD and Studio Visualizer software to produce virtual 3D animations and physical mock-ups.

**GAPT1220 | Applied Color Theory | Laboratory (1 Credit)**

Practice the use of color from design through output. Color palettes, color matching systems, process and custom inks, color separating, color measurement, color indexing, introduction to color management.

**Prerequisite(s):** GAPT1150

**GAPT1230 | Image Composition & Effects | Laboratory (1 Credit)**

Investigate Photoshop core competencies for designers and pre-media technicians related to image editing and compositing. Practice masking, layer organization and blending, basic color correction, vector/raster collage work, subject silhouetting, and creating shadows and reflections.

**Prerequisite(s):** GAPT1120

**GDES1210 | Typography | Lec/Lab (2 Credits)**

Examine typographic principles with an overview of the history of type. Identify typographic vocabulary, and explain the use of typography as a tool to enhance visual interest and communication.

**Prerequisite(s):** GAPT1110

**GDES1220 | Design for Print | Lec/Lab (2 Credits)**

Practice of basic design principles applied to projects destined for traditional print media. Create various print projects from concept, brand development and design asset coordination to print ready files. Demonstrate critical design analysis through classroom critiques.

**Prerequisite(s):** GAPT1110

**CWEB1000 | Introduction to Web Languages | Lec/Studio (2 Credits)**

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout.

**GDES1231 | Vector Design | Laboratory (1 Credit)**

Introduction to two-dimensional design through a study of principles and elements of design. Explore these principles and elements using Adobe Illustrator.

**Prerequisite(s):** GAPT1110 And GAPT1120

**PREP1220 | Advanced Image Editing | Laboratory (1 Credit)**

A lab intensive investigation into high end color retouching and photo enhancement, cosmetic retouching, CameraRAW, advanced layer work and special effects.

**Prerequisite(s):** GAPT1230

**GDES2220 | Information Design | Lec/Lab (2 Credits)**

A combination of theory and practice covering principles of design, perception and usability; demonstrate how graphic design can positively affect the presentation of information.

**Prerequisite(s):** GDES1210

**GAPT2110 | Color Management | Lec/Lab (2 Credits)**

Cross-disciplinary course uniting design, pre-media and press students for the practical application of color managed work flows. Calibration, characterization, and conversion best practices. Team based creation and production of related color print samples managed across multiple devices.

**Prerequisite(s):** GAPT1220

**GDES2120 | Design for Publication | Lec/Lab (2 Credits)**

Investigation and design of structural systems and organizational methods for multi-page documents, such as newsletters, magazines, books and catalogs. Cross-media publication processes will also be explored.

**Prerequisite(s):** GDES1210 And GDES1220

**GAPT2120 | Web Graphics | Lec/Lab (2 Credits)**

Introduction to web design from creating wire frames to finished mockups. Emphasis is on web page layout and the creation and formatting of the graphic elements on a web page.

**Prerequisite(s):** CWEB1000, Or CWEB1010, Or CDEV1010

**PREP2111 | Advanced Structural Design | Lec/Lab (2 Credits)**

Design and produce elaborate folded structures such as free standing displays and pop-up designs, as well as other paper, paperboard and corrugated structures including furniture and other recyclable and useful products. Produce virtualized 3D visualizations of designs prior to committing them to physical material. Opportunity to compete for national recognition in folding carton design may be available through this class.

**Prerequisite(s):** GAPT1210

**GDES2140 | Design for Animation & Interactivity | Lec/Lab (2 Credits)**

Introduction to the concepts and tools used for creating time and motion based design including documents that involve user interaction. Students will create 2-D animations from storyboarding to finished stand alone or web-based projects.

**Prerequisite(s):** GAPT1110 And GDES1231

**GDES2210 | Business of Design | Lec/Lab (2 Credits)**

Basics of marketing, proposals, legal considerations, and working with clients; an overview of potential career paths for designers. Develop individual professional brand marks and identity system.

**GDES2110 | Design for Digital Print | Lec/Lab (2 Credits)**

Principles of design for contemporary digital output devices and the special design considerations required. Introduction to opportunities unique to digital output including wide format, short run printing and variable data output.

**Prerequisite(s):** GDES1210 And GDES1220

**GDES2230 | Graphic Design Portfolio | Studio (1 Credit)**

Planning and preparation of both an analog and digital presentation of student design work as evidence of graphic design skills and abilities. Focus on selection, organization and presentation for professional advancement.

**Prerequisite(s):** GDES2120 And GDES2220

**GAPT2240 | Graphic Arts Industry Internship | Internship (4 Credits)**

Applying and developing technical skills and professional behavior; monitored on-the-job work experience.

**GDES2240 | Graphic Design Capstone | Capstone (4 Credits)**

Applying and developing technical skills and professional behavior for graphic designers; a closely supervised, project-based experience.

**Prerequisite(s):** GDES2120 And GDES2220

**ARTS1250 | History of Design | Lecture (3 Credits)**

A survey of major movements and tendencies, and key figures in the development of graphic, craft, and industrial design between the mid-nineteenth century and the present day.

**General Education:** Humanities

**ENGL1010 | English | Lecture (3 Credits)**

Analyze the research and essay-writing process for purpose, planning, drafting, and revision. Explore writing patterns and thought development. Incorporate concepts of grammar and usage, documentation, source relevancy and credibility. Focus is on clear, concrete writing.

**General Education:** Communications



## Pre-Media Technologies (PREP), AAS

The Pre-Media Technologies program prepares graduates for a wide array of career opportunities in the graphics industry with an emphasis on digital printing and packaging. Graduates are prepared to work in the industry in pre-press and technical support roles. Job duties often include all or some of the following: structural package design, photo retouching and restoration, application support and training, digital printing, large format print and installation, print measurement and validation, project management, sales, interactive content development, and workflow automation.

The program provides students instruction in color theory and color management, image capture and editing, page layout, production workflow, digital asset management, package layout and design, 3D visualizations and virtual reality, and more. Arts & Sciences curriculum both supports the students' technical direction and enhances their oral and written communication skills, fundamental math skills, and critical thinking ability. The course of study culminates in an industry internship or capstone project where the students gain on-the-job experience.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

**Bachelor's Completion Option(s):** Business Management Leadership (AMGT), Bachelor of Science (p. 10)

## Program Outcomes

### Program Outcomes:

- Operate and maintain equipment safely.
- Diagram graphics workflows.
- Explain various graphics industry segments.
- Prepare documents to industry standards.
- Produce printed pieces.
- Apply graphics measurement tools.
- Manage color outcomes.
- Relate various graphic aspects from a design, pre-media, and press viewpoint.
- Automate repetitive pre-media tasks.
- Plan pre-media projects.
- Demonstrate professional workplace behavior.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
ARTS1250	History of Design	3
ENGL1010	English	3
Communications		3
Diversity		2
Natural Science/Mathematics		3
Social Sciences		3
General Electives		3
<b>Technical Requirements</b>		
GAPT1110	Design Principles & Applications	3

GAPT1120	Pre-Media Principles & Applications	3
GAPT1130	21st Century Graphic Communication	3
GAPT1141	Introduction to Web Design	1
GAPT1150	Introduction to Color Theory	1
GAPT1210	Packaging Design	2
GAPT1220	Applied Color Theory	1
GAPT1230	Image Composition & Effects	1
GDES1210	Typography	2
GDES1220	Design for Print	2
CWEB1000	Introduction to Web Languages	2
GDES1231	Vector Design	1
PREP1220	Advanced Image Editing	1
GAPT2110	Color Management	2
PREP2120	Imposition & Variable Output	2
PREP2130	Job Engineering	2
GAPT2120	Web Graphics	2
PREP2210	Asset Management	1
PREP2220	3-D Imaging	1
PREP2230	Large Format Production	1
PREP2240	Pre-Media Portfolio	1
GAPT2230	Business of Print	1
<b>Technical Elective (Choose one course):</b>		2
PREP2111	Advanced Structural Design	
GDES2140	Design for Animation & Interactivity	
<b>Technical Elective (Choose one course):</b>		4
GAPT2240	Graphic Arts Industry Internship	
PREP2250	Pre-Media Capstone	
<b>Total Credits</b>		<b>62</b>

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
GAPT1110	Design Principles & Applications	3
GAPT1120	Pre-Media Principles & Applications	3
GAPT1130	21st Century Graphic Communication	3
GAPT1141	Introduction to Web Design	1
GAPT1150	Introduction to Color Theory	1
Communications		3
Natural Science/Mathematics		3
<b>Credits</b>		<b>17</b>
<b>Total Credits</b>		<b>17</b>

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
GAPT1210	Packaging Design	2
GAPT1220	Applied Color Theory	1
GAPT1230	Image Composition & Effects	1
GDES1210	Typography	2
GDES1220	Design for Print	2
CWEB1000	Introduction to Web Languages	2
GDES1231	Vector Design	1
PREP1220	Advanced Image Editing	1
ARTS1250	History of Design	3
Diversity		2
Credits		17
Total Credits		17

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
GAPT2110	Color Management	2
PREP2120	Imposition & Variable Output	2
PREP2130	Job Engineering	2
PREP2111 or GDES2140	Advanced Structural Design or Design for Animation & Interactivity	2
GAPT2120	Web Graphics	2
ENGL1010	English	3
Social Sciences		3
Credits		16
Total Credits		16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
PREP2210	Asset Management	1
PREP2220	3-D Imaging	1
PREP2230	Large Format Production	1
PREP2240	Pre-Media Portfolio	1
GAPT2230	Business of Print	1
GAPT2240 or PREP2250	Graphic Arts Industry Internship or Pre-Media Capstone	4
General Electives		3
Credits		12
Total Credits		12

## Courses

### Course Descriptions

#### GAPT1110 | Design Principles & Applications | Lec/Lab (3 Credits)

Introduction to design principles and processes, including creative problem solving, design work flows, and industry best practices; includes typography, drawing, layout and composition. Explore Adobe Creative Suite.

#### GAPT1120 | Pre-Media Principles & Applications | Lec/Lab (3 Credits)

Introduction to pre-media principles and processes. Input, edit, output and archive media assets for all possible print and online outcomes. Explore various pre-media workflows, using industry best practices.

#### GAPT1130 | 21st Century Graphic Communication | Lec/Lab (3 Credits)

Introduction to digital and analog print processes, and various bindery and finishing technologies. Prepare and test for Flexographic Technical Association Level One Certification.

#### GAPT1141 | Introduction to Web Design | Laboratory (1 Credit)

Introduction to web design using a graphical user interface web development tool. Basics of HTML and CSS with an emphasis on web design principles and file management.

#### GAPT1150 | Introduction to Color Theory | Lecture (1 Credit)

The importance and power of color in graphic communication, brand identity, and color reproduction. Color psychology, science and applications. Hands-on exploration of RGB, LAB and CMYK color spaces.

#### GAPT1210 | Packaging Design | Lec/Lab (2 Credits)

Investigate the concepts of folding carton design and production for retail and commercial use. Client-driven creation of a custom folding carton from structural design through finished branded prototype and formal presentation. Train on industry standard ArtiosCAD and Studio Visualizer software to produce virtual 3D animations and physical mock-ups.

#### GAPT1220 | Applied Color Theory | Laboratory (1 Credit)

Practice the use of color from design through output. Color palettes, color matching systems, process and custom inks, color separating, color measurement, color indexing, introduction to color management.

**Prerequisite(s):** GAPT1150

#### GAPT1230 | Image Composition & Effects | Laboratory (1 Credit)

Investigate Photoshop core competencies for designers and pre-media technicians related to image editing and compositing. Practice masking, layer organization and blending, basic color correction, vector/raster collage work, subject silhouetting, and creating shadows and reflections.

**Prerequisite(s):** GAPT1120

#### GDES1210 | Typography | Lec/Lab (2 Credits)

Examine typographic principles with an overview of the history of type. Identify typographic vocabulary, and explain the use of typography as a tool to enhance visual interest and communication.

**Prerequisite(s):** GAPT1110

#### GDES1220 | Design for Print | Lec/Lab (2 Credits)

Practice of basic design principles applied to projects destined for traditional print media. Create various print projects from concept, brand development and design asset coordination to print ready files. Demonstrate critical design analysis through classroom critiques.

**Prerequisite(s):** GAPT1110

#### CWEB1000 | Introduction to Web Languages | Lec/Studio (2 Credits)

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout.

#### GDES1231 | Vector Design | Laboratory (1 Credit)

Introduction to two-dimensional design through a study of principles and elements of design. Explore these principles and elements using Adobe Illustrator.

**Prerequisite(s):** GAPT1110 And GAPT1120

#### PREP1220 | Advanced Image Editing | Laboratory (1 Credit)

A lab intensive investigation into high end color retouching and photo enhancement, cosmetic retouching, CameraRAW, advanced layer work and special effects.

**Prerequisite(s):** GAPT1230

#### GAPT2110 | Color Management | Lec/Lab (2 Credits)

Cross-disciplinary course uniting design, pre-media and press students for the practical application of color managed work flows. Calibration, characterization, and conversion best practices. Team based creation and production of related color print samples managed across multiple devices.

**Prerequisite(s):** GAPT1220

**PREP2120 | Imposition & Variable Output | Lec/Lab (2 Credits)**

Inquiry into the many techniques used for the organized output of multiple pages, designs or images. Page imposition, step and repeat, ganging and nesting are considered. Examine the basic software and workflow tools and techniques for personalized printing, variable data, and one-to-one marketing.

**Prerequisite(s):** PREP1210 Or GAPT1210

**PREP2130 | Job Engineering | Lec/Lab (2 Credits)**

A lab-intensive inquiry into the planning, execution and automation of pre-media workflow in order to maximize efficiency, productivity and repeatability in a fast-paced networked environment. Use the latest high end pre-media software in conjunction with Adobe Creative Suite.

**Prerequisite(s):** PREP1210 Or GAPT1210

**PREP2111 | Advanced Structural Design | Lec/Lab (2 Credits)**

Design and produce elaborate folded structures such as free standing displays and pop-up designs, as well as other paper, paperboard and corrugated structures including furniture and other recyclable and useful products. Produce virtualized 3D visualizations of designs prior to committing them to physical material. Opportunity to compete for national recognition in folding carton design may be available through this class.

**Prerequisite(s):** GAPT1210

**GDES2140 | Design for Animation & Interactivity | Lec/Lab (2 Credits)**

Introduction to the concepts and tools used for creating time and motion based design including documents that involve user interaction. Students will create 2-D animations from storyboarding to finished stand alone or web-based projects.

**Prerequisite(s):** GAPT1110 And GDES1231

**GAPT2120 | Web Graphics | Lec/Lab (2 Credits)**

Introduction to web design from creating wire frames to finished mockups. Emphasis is on web page layout and the creation and formatting of the graphic elements on a web page.

**Prerequisite(s):** CWEB1000, Or CWEB1010, Or CDEV1010

**PREP2210 | Asset Management | Laboratory (1 Credit)**

Industry's best practices related to the storage, back up, organization, cataloguing, retrieval and repurposing of digital assets; includes naming conventions, compression techniques, metadata, RAID levels and cloud storage.

**PREP2220 | 3-D Imaging | Laboratory (1 Credit)**

The creation and manipulation of three-dimensional images intended for online use for video, animations and remote proofing, using Adobe Illustrator, Photoshop, ArtiosCAD and Studio Visualizer.

**PREP2230 | Large Format Production | Laboratory (1 Credit)**

The creation, printing, finishing and installation of graphics intended for large and grande format inkjet output. Produce and install floor graphics, murals and wraps.

**PREP2240 | Pre-Media Portfolio | Studio (1 Credit)**

The planning, organization and preparation of both physical and digital presentations demonstrating breadth of competencies and individual strengths, for the purpose of professional advancement.

**GAPT2230 | Business of Print | Lecture (1 Credit)**

The basics of print business operations, including profit and loss, equipment costs, rates and shift considerations, wages and benefits, and domestic versus offshore production. Other related topics include lean manufacturing and six sigma principles, as well as emerging shifts toward consultative practices, marketing and brand management, as practiced in the packaging and digital printing industries.

**GAPT2240 | Graphic Arts Industry Internship | Internship (4 Credits)**

Applying and developing technical skills and professional behavior; monitored on-the-job work experience.

**PREP2250 | Pre-Media Capstone | Capstone (4 Credits)**

Applying and developing technical skills and professional behavior for pre-media technicians; a closely supervised, project-based experience.

**ARTS1250 | History of Design | Lecture (3 Credits)**

A survey of major movements and tendencies, and key figures in the development of graphic, craft, and industrial design between the mid-nineteenth century and the present day.

**General Education:** Humanities

**ENGL1010 | English | Lecture (3 Credits)**

Analyze the research and essay-writing process for purpose, planning, drafting, and revision. Explore writing patterns and thought development. Incorporate concepts of grammar and usage, documentation, source relevancy and credibility. Focus is on clear, concrete writing.

**General Education:** Communications

## Health Sciences & Technology Department

- Radiologic Technology (RTEC), AAS (p. 77)

### Radiologic Technology (RTEC), AAS

The Radiologic Technology program prepares graduates who oversee X-rays, CT scans, and other radiologic procedures. They also manage radiology support staff in hospitals, clinics, and specialized imaging centers. Students learn to work directly with patients and physicians to create images of internal organs, bones, and tissues that are used to diagnose medical problems. Working in both classroom and lab settings, students gain the skills to use the latest in imaging technologies, including digital X-rays and CT scans. They also complete rotations in clinical settings.

Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

Dunwoody's program is accredited by the Joint Review Committee on Education in Radiologic Technology.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters + 2 summer sessions)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** Joint Review Committee on Education in Radiologic Technology (JRCERT)

## Program Outcomes

### Program Outcomes:

- Demonstrate knowledge and skills relating to verbal, nonverbal and written medical communication.
- Analyze patient situations to successfully operate medical imaging systems and perform the examination and procedures.
- Operate medical imaging equipment and accessory devices.
- Anticipate and provide basic patient care and comfort.
- Provide appropriate patient education.
- Practice radiation protection for the patient, self and others.

- Perform competently a full range of radiologic procedures on children and adults in the following categories: Head/neck, Musculoskeletal, Trauma, Chest and breast, Bedside, Surgical, and Abdominal/gastrointestinal/ genitourinary.
- Exercise independent judgment in the technical performance of imaging procedures.
- Determine radiographic exposure factors to obtain diagnostic quality radiographic images with minimum radiation exposures.
- Evaluate medical images for technical quality.
- Understands the safe limits of equipment operation and report malfunctions to the proper authorities.
- Understand basic x-ray production and interactions.
- Demonstrate knowledge of human structure, function, and pathology.
- Demonstrate knowledge and skills relating to quality assurance.
- Demonstrate knowledge and skills relating to medical image processing.
- Demonstrate ethical responsibility, support the professions code of ethics and comply with the profession's scope of practice.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
BIOL1230	Anatomy	4
BIOL1310	Physiology I	2
BIOL1320	Physiology II	2
BIOL1400	Human Disease	4
Communications		3
Humanities		2
Mathematics		2
Social Sciences		3
<b>Technical Requirements</b>		
RTEC1110	Introduction to Radiography	2
RTEC1120	Patient Care	2
RTEC1130	Radiographic Procedures I	1
RTEC1150	Clinical I	3
RTEC1220	Radiographic Procedures II	1
RTEC1230	Radiographic Procedures III	1
RTEC1240	Clinical II	3
RTEC1250	Clinical III	3
RTEC1140	Medical Terminology	1
RTEC1210	Radiologic Exposure	1
RTEC1310	Radiographic Procedures IV	1
RTEC1320	Clinical IV	3
RTEC2110	Radiologic Science	1
RTEC2121	Advanced Imaging	1
RTEC2130	Clinical V	6
RTEC2220	Radiologic Topics I	1
RTEC2230	Radiologic Topics II	1
RTEC2250	Clinical VI	3
RTEC2260	Clinical VII	3
RTEC2210	Radiation Biology & Protection	1
RTEC2240	Ethics in Healthcare	1

RTEC2310	Radiologic Topics III	1
RTEC2320	Clinical VIII	3
Total Credits		66

## Sample Academic Plan

## Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
RTEC1110	Introduction to Radiography	2
RTEC1120	Patient Care	2
RTEC1130	Radiographic Procedures I	1
RTEC1150	Clinical I	3
BIOL1230	Anatomy	4
BIOL1310	Physiology I	2
Credits		14
Total Credits		14

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
RTEC1220	Radiographic Procedures II	1
RTEC1230	Radiographic Procedures III	1
RTEC1240	Clinical II	3
RTEC1250	Clinical III	3
BIOL1320	Physiology II	2
BIOL1400	Human Disease	4
Credits		14
Total Credits		14

Course	Title	Credits
<b>First Year</b>		
<b>Summer</b>		
RTEC1140	Medical Terminology	1
RTEC1210	Radiologic Exposure	1
RTEC1310	Radiographic Procedures IV	1
RTEC1320	Clinical IV	3
Credits		6
Total Credits		6

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
RTEC2110	Radiologic Science	1
RTEC2121	Advanced Imaging	1
RTEC2130	Clinical V	6
Communications		3
Mathematics		2
Credits		13
Total Credits		13

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
RTEC2220	Radiologic Topics I	1
RTEC2230	Radiologic Topics II	1
RTEC2250	Clinical VI	3
RTEC2260	Clinical VII	3
Humanities		2
Social Sciences		3
	Credits	13
	Total Credits	13
<b>Summer</b>		
RTEC2210	Radiation Biology & Protection	1
RTEC2240	Ethics in Healthcare	1
RTEC2310	Radiologic Topics III	1
RTEC2320	Clinical VIII	3
	Credits	6
	Total Credits	6

## Courses

### Course Descriptions

#### RTEC1110 | Introduction to Radiography | Lecture (2 Credits)

An overview of radiography and patient care. Orientation to the radiographic profession as a whole. Introduction to the skills required to perform radiologic procedures with an emphasis placed on the production and evaluation of quality radiographs. Topics include: equipment introduction, ethics, medical, and legal considerations; procedures and anatomy related to the chest and abdomen.

#### RTEC1120 | Patient Care | Lecture (2 Credits)

Examine the basic fundamentals required to assess a patient's condition, identify emergency situations, and respond to acute life threatening situations within their scope of practice. Determine the foundations of quality patient care and care management plans, both as an individual and as a vital team player. Emphasis is on fundamental principles, practices, and issues common to radiography.

#### RTEC1130 | Radiographic Procedures I | Lecture (1 Credit)

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the upper extremities, the shoulder girdle, and the lower extremities.

#### RTEC1150 | Clinical I | Clinical (3 Credits)

Introduction to the hospital clinical setting; provides an opportunity to participate in or observe radiographic procedures. Topics include: orientation to hospital or clinic areas and procedures, mobile/surgery, and radiography. Participate in and/or observe procedures related to chest and abdomen. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

**Prerequisite(s):** RTEC1110

#### RTEC1220 | Radiographic Procedures II | Lecture (1 Credit)

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the lower extremities, the pelvic girdle, and the spine.

**Prerequisite(s):** RTEC1130

#### RTEC1230 | Radiographic Procedures III | Lecture (1 Credit)

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the lumbosacral spine, the bony thorax, the cranium, facial bones, and sinuses; anatomy and procedures of the upper gastrointestinal (GI).

**Prerequisite(s):** RTEC1220

#### RTEC1240 | Clinical II | Clinical (3 Credits)

Continue learning experiences in the clinic or hospital setting. Topics include: equipment utilization, exposure techniques, participation in and/or observation of routine projections of the upper and lower extremities. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

#### RTEC1250 | Clinical III | Clinical (3 Credits)

Continue learning experiences in the clinic or hospital setting. Focus is on the pelvis, the spine, and common portable radiography procedures. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

#### RTEC1140 | Medical Terminology | Lecture (1 Credit)

Develop a medical vocabulary. Skills in spelling, pronunciation, and defining medical terms is emphasized.

#### RTEC1210 | Radiologic Exposure | Lecture (1 Credit)

Examine the factors that govern and influence the production of the radiographic image, includes exposure calculations.

#### RTEC1310 | Radiographic Procedures IV | Lecture (1 Credit)

Continue to develop the knowledge required to perform radiographic procedures. Topics include: anatomy and procedures of the lower gastrointestinal (GI), genitourinary (GU), the biliary system, and minor system procedures.

**Prerequisite(s):** RTEC1230

#### RTEC1320 | Clinical IV | Clinical (3 Credits)

Continue hospital or clinic setting work experience. Develop proficiency in executing procedures introduced in Radiographic Procedures. Focus is on bony thorax, cranial bone, facial bone, and sinuses. Examine common fluoroscopic procedures and common radiographic procedures in surgery. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

#### RTEC2110 | Radiologic Science | Lecture (1 Credit)

Concepts of basic radiographic physics and the basics of x-ray generating equipment.

**Prerequisite(s):** RTEC1210

#### RTEC2121 | Advanced Imaging | Lecture (1 Credit)

Equipment routinely utilized to produce diagnostic images, as well as various recording media and techniques. Topics include: Venipuncture; Image production in CT, MRI, IR, and other imaging modalities; special imaging considerations for geriatric, pediatric, trauma, and mobile imaging procedures; and sectional anatomy of the head, thorax, and abdomen.

**Prerequisite(s):** RTEC1310

#### RTEC2130 | Clinical V | Clinical (6 Credits)

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: common fluoroscopic, surgery, and portable radiography procedures. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.



**RTEC2220 | Radiologic Topics I | Lecture (1 Credit)**

A review of basic knowledge from previous courses to help the student prepare for the national certification examination. Topics include: image analysis, pathology, quality assurance, digital radiography, computers and PACS.

**RTEC2230 | Radiologic Topics II | Lecture (1 Credit)**

Quality assurance, digital imaging, image analysis, resume and career planning; a review of basic knowledge from previous courses to help the student prepare for the national certification examination.

**RTEC2250 | Clinical VI | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: advanced radiographic anatomy; equipment utilization; exposure techniques; sterile techniques; participation in and/or observation of angiographic, interventional and specialty rotations including MRI and CT. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2260 | Clinical VII | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: advanced radiographic anatomy; equipment utilization; exposure techniques; sterile techniques; participation in and/or observation of angiographic, interventional and specialty rotations including MRI and CT. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2210 | Radiation Biology & Protection | Lecture (1 Credit)**

Radiation detection and measurement, patient protection, personnel protection, absorbed dose equivalencies, agencies and regulations, introduction to radiation biology, cell anatomy, radiation/cell interaction and effects of radiation.

**RTEC2240 | Ethics in Healthcare | Lecture (1 Credit)**

Increase awareness of the many complex issues that face the healthcare industry; critically evaluate an issue taking into consideration all sides and opinions along with supporting reasoning.

**RTEC2310 | Radiologic Topics III | Lecture (1 Credit)**

A review of basic knowledge from previous courses to help the student prepare for the national certification examination. Topics include: image analysis, image production and evaluation; radiographic procedures; anatomy, physiology, pathology, and terminology; equipment operation and quality control; radiation protection; and patient care and education.

**RTEC2320 | Clinical VIII | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Includes participation in and/or observation of routine and special radiographic procedures. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**BIOL1230 | Anatomy | Lec/Lab (4 Credits)**

Analyze the structure of the human body, molecular, cellular to organism level. Examine cell biology, integumentary, muscular, skeletal, neurological, digestive, respiratory, urinary, cardiovascular, endocrine, lymphatic, and reproductive body systems and the correlation/integration of the various systems to construct the human organism.

**General Education:** Natural Sciences

**BIOL1310 | Physiology I | Lec/Lab (2 Credits)**

Analyze the functioning of the human body, molecular, cellular to organism level. Examine body systems, such as cell biology, muscular, skeletal, neurological, digestive and respiratory and the correlation/integration of the various systems in impacting the functioning of the human organism.

**Prerequisite(s):** BIOL1230

**General Education:** Natural Sciences

**BIOL1320 | Physiology II | Lec/Lab (2 Credits)**

Analyze the functioning of the human body, molecular, cellular to organism level. Examine body systems such as urinary, body defenses, cardiovascular, endocrine, lymphatic, and reproductive and the correlation/integration of the various systems in impacting the functioning of the human organism.

**Prerequisite(s):** BIOL1310

**General Education:** Natural Sciences

**BIOL1400 | Human Disease | Lec/Lab (4 Credits)**

Analysis of the disease conditions affecting the human body, including their pathological origin, signs and symptoms, pathological process, diagnostics, and treatment modalities.

**Prerequisite(s):** BIOL1320

**General Education:** Natural Sciences

## Robotics & Manufacturing Department

- Automated Systems & Robotics (ASRO), AAS (p. 80)
- Design for Manufacturing 3D Printing (3DPT), Certificate (p. 82)
- Electronics Engineering Technology (ELTT), AAS (p. 83)
- Electronics Technology (IELT), AAS (p. 85)
- Electronics Technology (IELT), Certificate (p. 87)
- Engineering Drafting & Design (MDES), AAS (p. 88)
- Industrial Controls & Robotics (ICON), AAS (p. 90)
- Industrial Controls (ICOT), Certificate (p. 91)
- Machine Tool Technology (MACH), AAS (p. 92)
- Right Skills Now for Manufacturing (CNC) (RSNM), Certificate (p. 94)
- Welding and Metal Fabrication (WMET), AAS (p. 95)
- Welding Technology (WELD), Certificate (p. 97)

## Automated Systems & Robotics (ASRO), AAS

The Automated Systems & Robotics program provides students with the entry-level skills and theoretical knowledge to maintain the latest in automated manufacturing, packaging, and industrial robotic systems. Graduates from this program are prepared to enter the industry as machine assemblers, electro-mechanical technicians, maintenance mechanics, and field service engineers.

The course of study includes: basic electricity and electronics; mechanical systems; electronic sensors; programmable logic controllers (PLCs); industrial robotics; motion-control systems; and advanced packaging and manufacturing systems.

Program curriculum is aligned with standards set forth by the Packaging Machinery Manufacturers Institute (PMMI), the Institute of Packaging Professionals (IoPP), the Robotics Industry Association (RIA), the

National Fire Protection Association (NFPA), and the Instrumentation Society of America (ISA). Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.
- Explain the operation of electronic devices.
- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics and mechanical prints.
- Perform maintenance on mechanical systems.
- Commission and maintain industrial control systems.
- Commission and maintain industrial robots.
- Perform duties on an industry-related internship or capstone project.

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1500	Algebra, Trig & Boolean Algebra	5
	Communications	5
	Diversity	2
	Humanities	3
	Social Sciences	3
	General Electives	2
<b>Technical Requirements</b>		
ELTT1110	Basic Electricity & Electronics Lab	5
ELTT1120	Basic Electricity & Electronics Theory	8
MDES1110	Engineering Drawings with SolidWorks	4
MACH1200	Machine Shop Fundamentals	3
ASRO1210	Mechanical Transmission of Power Lab	2
ASRO1220	Mechanical Transmission of Power Theory	4
ASRO2110	Industrial Controls & PLCs Lab	5
ASRO2120	Industrial Controls & PLCs Theory	8
ASRO2230	Industrial Robotics Lab	2
ASRO2241	Industrial Robotics Theory	5
ASRO2291	Industrial Internship/Practicum	6
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including

elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELTT1110	Basic Electricity & Electronics Lab	5
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1500	Algebra, Trig & Boolean Algebra	5
Credits		18
Total Credits		18

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
MDES1110	Engineering Drawings with SolidWorks	4
MACH1200	Machine Shop Fundamentals	3
ASRO1210	Mechanical Transmission of Power Lab	2
ASRO1220	Mechanical Transmission of Power Theory	4
	Humanities	3
	General Electives	2
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
ASRO2110	Industrial Controls & PLCs Lab	5
ASRO2120	Industrial Controls & PLCs Theory	8
	Communications	5
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
ASRO2230	Industrial Robotics Lab	2
ASRO2241	Industrial Robotics Theory	5
ASRO2291	Industrial Internship/Practicum	6
	Diversity	2
	Social Sciences	3
Credits		18
Total Credits		18

## Courses

### Course Descriptions

**ELTT1110 | Basic Electricity & Electronics Lab | Laboratory (5 Credits)**

Analyze, design and build series, parallel and combination AC and DC circuits. Semiconductor circuits, power supplies, transistor circuits are built and tested using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

**ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)**

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

**MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)**

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

**MACH1200 | Machine Shop Fundamentals | Laboratory (3 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**ASRO1210 | Mechanical Transmission of Power Lab | Laboratory (2 Credits)**

Assembling, disassembling and observing applications of bearings, gears, cams, motors, clutches, cylinders (hydraulic and pneumatic), fluid systems, mechanical systems and other automation related components. Drawing and fabrication of simple components.

**ASRO1220 | Mechanical Transmission of Power Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with various components of machines including bearings, gears, cams, motors, clutches, cylinders (hydraulic and pneumatic), fluid systems, mechanical systems and other automation related components.

**ASRO2110 | Industrial Controls & PLCs Lab | Laboratory (5 Credits)**

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

**ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)**

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

**ASRO2210 | Automation & Packaging Lab | Laboratory (2 Credits)**

Set up configuration and troubleshooting of installed automation and packaging equipment using machine schematics and related documentation.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ASRO2220

**ASRO2220 | Automation & Packaging Theory | Lecture (3 Credits)**

Identification, recognition and calculations associated with automation and packaging components, motion control, electrical safety, documentation, motors, control circuits and related documentation. Investigation of packaging and automation career options and industry related skills.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ASRO2210

**ASRO2230 | Industrial Robotics Lab | Laboratory (2 Credits)**

Set up, configuration, programming and troubleshooting industrial robots to meet industry standards. Industry safety standards, programming methods, applications and interfacing of sensors and I/O devices.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ASRO2240 ASRO2241

**ASRO2241 | Industrial Robotics Theory | Lecture (5 Credits)**

Identification, recognition and calculations associated with industrial robotics including terminology, safety practices and procedures, application justifications, robot types, operation, program instructions and techniques, I/O device interfacing, end of arm tooling, system integration and troubleshooting.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ASRO2230

**ASRO2291 | Industrial Internship/Practicum | Internship (6 Credits)**

Internship or practicum option on various manufacturing topics: automation, electronics, robotics, mechanical systems, assembly, troubleshooting, research and/or field service.

**MATH1500 | Algebra, Trig & Boolean Algebra | Lecture (5 Credits)**

Polynomials, proportions and linear equations. Trig functions, graphs, and vectors. Binary, octal and hexadecimal number systems. Boolean Algebra and mapping.

**General Education:** Mathematics

## Design for Manufacturing 3D Printing

The Design for Manufacturing Certificate in 3D Printing is offered as either a standalone certification or stackable credential for individuals looking to advance their knowledge of 3D printing. This certification was designed through a unique partnership between Dunwoody College of Technology and Stratasys Inc. The program prepares students to utilize 3D printing hardware and software in the development of advanced manufacturing processes. Courses are also offered to non-matriculating students looking to advance their knowledge in targeted areas.

Credits earned in the Design for Manufacturing: 3D Printing certificate directly transfer into Dunwoody's **Engineering Drafting & Design (MDES)** or **Machine Tool Technology (MACH)** associate's degree programs.

**Credential Earned:** Certificate

**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

## Program Outcomes

### Program Outcomes:

- Create professional documentation in support of real-world designs.
- Apply knowledge of mathematics, science and engineering.
- Analyze traditional and contemporary manufacturing processes.
- Utilize problem-solving skills to overcome manufacturing challenges.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
MDES1110	Engineering Drawings with SolidWorks	4
MACH1000	Machine Shop Fundamentals	2
3DPT2100	3D Printing Applications	5
MDES1230	Geometric Dimensioning & Tolerances	4
MDES2130	Advanced SolidWorks	4
3DPT2200	Advanced 3D Printing Applications	5
Total Credits		24

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MDES1110	Engineering Drawings with SolidWorks	4
MACH1000	Machine Shop Fundamentals	2
3DPT2100	3D Printing Applications	5
Credits		11
Total Credits		11
<b>Second Year</b>		
<b>Spring</b>		
MDES1230	Geometric Dimensioning & Tolerances	4
MDES2130	Advanced SolidWorks	4
3DPT2200	Advanced 3D Printing Applications	5
Credits		13
Total Credits		13

## Courses

### Course Descriptions

#### MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

#### MACH1000 | Machine Shop Fundamentals | Laboratory (2 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

#### 3DPT2100 | 3D Printing Applications | Lecture (5 Credits)

Explore traditional, additive and hybrid applications in the core manufacturing processes. Design and print prototype parts and tools to be used in various manufacturing processes.

**Prerequisite(s):** MDES1110

#### MDES1230 | Geometric Dimensioning & Tolerances | Lecture (4 Credits)

Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MDES1210

#### MDES2130 | Advanced SolidWorks | Lecture (4 Credits)

Simulation (Finite Element Analysis) and advanced surface modeling techniques. Culminates in testing for CSWA certification.

**Prerequisite(s):** MDES1110

#### 3DPT2200 | Advanced 3D Printing Applications | Lecture (5 Credits)

Design 3D printed tooling for traditional manufacturing processes. Utilize tools in metal-casting, thermoforming, jigs, fixtures and other applications.

**Prerequisite(s):** 3DPT2100

## Electronics Engineering Technology (ELTT), AAS

The Electronics Engineering Technology program provides students with the entry-level skills and theoretical knowledge needed to design and troubleshoot circuits utilizing the latest semiconductor devices; biomedical devices; microprocessors; microcontrollers; circuit design and fabrication equipment; and data acquisition devices. Graduates from this program are prepared to enter the industry as electronics technicians, electronic assemblers, programmers, calibration technicians, and field service technicians.

The course of study includes: basic electricity and electronics; digital electronics; microprocessors and micro-controllers; computer programming; programmable logic controllers (PLCs); communication systems; and circuit engineering. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester; Spring Semester

**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.
- Explain the operation of electronic devices.
- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics and mechanical prints.
- Employ fundamental concepts of industrial electronics and process control.

- Apply concepts of analog and digital communication systems.
- Analyze the operation of microprocessors, micro-controllers, and computers.
- Perform duties on an industry-related internship or capstone project.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1500	Algebra, Trig & Boolean Algebra	5
	Communications	5
	Diversity	2
	Humanities	3
	Social Sciences	3
	General Electives	2
<b>Technical Requirements</b>		
ELTT1110	Basic Electricity & Electronics Lab	5
ELTT1120	Basic Electricity & Electronics Theory	8
ELTT1210	Digital & Microprocessors Lab	3
ELTT1220	Digital & Microprocessors Theory	8
ELTT1230	PCB & Circuit Development	1
ELTT1240	Programming Fundamentals	1
ASRO2110	Industrial Controls & PLCs Lab	5
ASRO2120	Industrial Controls & PLCs Theory	8
ELTT2211	Advanced Electronics Lab	2
ELTT2221	Advanced Electronics Theory	5
ASRO2291	Industrial Internship/Practicum	6
Total Credits		72

## Sample Academic Plan

## Sample Academic Plan

The following sample academic plan demonstrates how a student’s schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELTT1110	Basic Electricity & Electronics Lab	5
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1500	Algebra, Trig & Boolean Algebra	5
Credits		18
Total Credits		18
<b>Second Year</b>		
<b>Spring</b>		
ELTT1210	Digital & Microprocessors Lab	3
ELTT1220	Digital & Microprocessors Theory	8
ELTT1230	PCB & Circuit Development	1

ELTT1240	Programming Fundamentals	1
Humanities		3
General Electives		2
Credits		18
Total Credits		18
<b>Second Year</b>		
<b>Fall</b>		
ASRO2110	Industrial Controls & PLCs Lab	5
ASRO2120	Industrial Controls & PLCs Theory	8
Communications		5
Credits		18
Total Credits		18
<b>Second Year</b>		
<b>Spring</b>		
ELTT2211	Advanced Electronics Lab	2
ELTT2221	Advanced Electronics Theory	5
ASRO2291	Industrial Internship/Practicum	6
Diversity		2
Social Sciences		3
Credits		18
Total Credits		18

## Courses

### Course Descriptions

**ELTT1110 | Basic Electricity & Electronics Lab | Laboratory (5 Credits)**  
Analyze, design and build series, parallel and combination AC and DC circuits. Semiconductor circuits, power supplies, transistor circuits are built and tested using protoboards and various test equipment.  
**Prerequisite(s):** ELEC1111 And ELEC1112  
**Corequisite(s):** ELTT1120

**ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)**  
Identification, recognition and calculations associated with basic electricity, including Ohm’s Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.  
**Prerequisite(s):** ELEC1111 And ELEC1112  
**Corequisite(s):** ELTT1100 ELTT1110

**ELTT1210 | Digital & Microprocessors Lab | Laboratory (3 Credits)**  
Design, build, and troubleshoot digital circuits. Debug and program microprocessors and microcontrollers for various operations and interface to external devices. Analyze digital and microprocessor circuits using industry standard test equipment.  
**Prerequisite(s):** ELTT1110  
**Corequisite(s):** ELTT1220

**ELTT1220 | Digital & Microprocessors Theory | Lecture (8 Credits)**  
Identification, recognition and calculations associated with combinational and sequential logic circuits as well as internal architecture of microprocessors and microcontrollers, programming, logic operations, memory mapping, addressing, data transfer, and system control.  
**Prerequisite(s):** ELTT1120  
**Corequisite(s):** ELTT1200 ELTT1210



**ELTT1230 | PCB & Circuit Development | Laboratory (1 Credit)**

Electronic circuit prototyping using various industry standards, hardware, and software. Utilize circuit manufacturing techniques to create surface mount and through hole circuit boards.

**Prerequisite(s):** ELTT1110

**ELTT1240 | Programming Fundamentals | Laboratory (1 Credit)**

Use algorithms and flowcharts to develop logic, execution control, data types, loops, and control structures for computer executable software. Utilizes National Instrument's LabVIEW.

**Prerequisite(s):** ELTT1110

**ASRO2110 | Industrial Controls & PLCs Lab | Laboratory (5 Credits)**

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

**ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)**

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

**ELTT2211 | Advanced Electronics Lab | Laboratory (2 Credits)**

Design and build single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1210

**Corequisite(s):** ELTT2220 ELTT2221

**ELTT2221 | Advanced Electronics Theory | Lecture (5 Credits)**

Identification, recognition and calculations associated with single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1220

**Corequisite(s):** ELTT2210 ELTT2211

**ASRO2291 | Industrial Internship/Practicum | Internship (6 Credits)**

Internship or practicum option on various manufacturing topics: automation, electronics, robotics, mechanical systems, assembly, troubleshooting, research and/or field service.

**MATH1500 | Algebra, Trig & Boolean Algebra | Lecture (5 Credits)**

Polynomials, proportions and linear equations. Trig functions, graphs, and vectors. Binary, octal and hexadecimal number systems. Boolean Algebra and mapping.

**General Education:** Mathematics

## Electronics Technology (IELT), AAS

The Electronics Technology program provides evening students with the entry-level skills and theoretical knowledge needed to design and troubleshoot circuits utilizing the latest semiconductor devices; biomedical devices; microprocessors; microcontrollers; circuit design; and fabrication equipment and data acquisition devices. Graduates from this program are prepared to enter the industry as electronics

technicians, assemblers, calibration technicians, and field service technicians.

The course of study includes: basic electricity and electronics; digital electronics; microprocessors and microcontrollers; programmable logic controllers (PLCs); communication systems; and circuit engineering. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills. A shorter certificate option is also available.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.
- Explain the operation of electronic devices.
- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics and mechanical prints.
- Employ fundamental concepts of industrial electronics and process control.
- Apply concepts of analog and digital communication systems.
- Analyze the operation of microprocessors, micro-controllers, and computers.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1000	Algebra & Trigonometry	3
MATH1250	Boolean Algebra	3
	Communications	3
	Diversity	2
	Humanities	3
	Social Sciences	3
	General Electives	3
<b>Technical Requirements</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
ELTT1200	Digital & Microprocessors Lab	2
ELTT1220	Digital & Microprocessors Theory	8
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
ELTT2200	Advanced Electronics Lab	2
ELTT2230	Advanced Electronics Theory	8
Total Credits		60

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1000	Algebra & Trigonometry	3
	Credits	13
	Total Credits	13

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
ELTT1200	Digital & Microprocessors Lab	2
ELTT1220	Digital & Microprocessors Theory	8
MATH1250	Boolean Algebra	3
General Electives		3
	Credits	16
	Total Credits	16

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
Communications		3
Social Sciences		3
	Credits	16
	Total Credits	16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
ELTT2200	Advanced Electronics Lab	2
ELTT2230	Advanced Electronics Theory	8
Diversity		2
Humanities		3
	Credits	15
	Total Credits	15

## Courses

### Course Descriptions

#### ELTT1100 | Basic Electricity & Electronics Lab | Laboratory (2 Credits)

Analyze, design, and build series, parallel and combination AC and DC circuits. Build and test semiconductor circuits, power supplies, transistor circuits using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

#### ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

#### ELTT1200 | Digital & Microprocessors Lab | Laboratory (2 Credits)

Design, build, and troubleshoot digital circuits. Debug and program microprocessors and microcontrollers for various operations and interface to external devices. Analyze digital and microprocessor circuits using industry standard test equipment.

**Prerequisite(s):** ELTT1100

**Corequisite(s):** ELTT1220

#### ELTT1220 | Digital & Microprocessors Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with combinational and sequential logic circuits as well as internal architecture of microprocessors and microcontrollers, programming, logic operations, memory mapping, addressing, data transfer, and system control.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ELTT1200 ELTT1210

#### ASRO2100 | Industrial Controls & PLCs Lab | Laboratory (2 Credits)

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

#### ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

#### ELTT2200 | Advanced Electronics Lab | Laboratory (2 Credits)

Design and build single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ELTT2220 ELTT2230

#### ELTT2230 | Advanced Electronics Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits as well as other advanced electronics topics.

**Prerequisite(s):** ELTT1220

**Corequisite(s):** ELTT2200

#### MATH1000 | Algebra & Trigonometry | Lecture (3 Credits)

Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations; trigonometric functions, solutions of triangles, radians, trig functions graphs, vectors, and basic identities.

**General Education:** Mathematics

**MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

# Electronics Technology (IELT), Certificate

## Overview

The Electronics Technology certificate provides evening students with the entry-level skills and theoretical knowledge needed to design and troubleshoot circuits utilizing the latest semiconductor devices, biomedical devices, microprocessors and microcontrollers. Graduates from this program are prepared to enter the industry as assemblers, troubleshooters, calibration technicians and field service technicians. The course of study includes: basic electricity and electronics; digital electronics; microprocessors; and microcontrollers. Students may choose to utilize these credits to continue on for an AAS Degree in either Industrial Controls & Robotics or Electronics Technology. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics and critical thinking skills.

Credits earned in the Electronics Technology certificate directly transfer into Dunwoody's Industrial Controls & Robotics (ICON) (p. 90) or Electronics Technology (IELT) (p. 85) associate's degree programs.

**Credential Earned:** Certificate

**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.
- Explain the operation of electronic devices.
- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics and mechanical prints.
- Employ fundamental concepts of industrial electronics and process control.
- Apply concepts of analog and digital communication systems.
- Analyze the operation of microprocessors, micro-controllers, and computers.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1000	Algebra & Trigonometry	3
<b>Technical Requirements</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
ELTT1200	Digital & Microprocessors Lab	2

ELTT1220	Digital & Microprocessors Theory	8
Total Credits		23

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1000	Algebra & Trigonometry	3
Credits		13
Total Credits		13
<b>Spring</b>		
ELTT1200	Digital & Microprocessors Lab	2
ELTT1220	Digital & Microprocessors Theory	8
Credits		10
Total Credits		10

## Courses

### Course Descriptions

#### ELTT1100 | Basic Electricity & Electronics Lab | Laboratory (2 Credits)

Analyze, design, and build series, parallel and combination AC and DC circuits. Build and test semiconductor circuits, power supplies, transistor circuits using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

#### ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

#### ELTT1200 | Digital & Microprocessors Lab | Laboratory (2 Credits)

Design, build, and troubleshoot digital circuits. Debug and program microprocessors and microcontrollers for various operations and interface to external devices. Analyze digital and microprocessor circuits using industry standard test equipment.

**Prerequisite(s):** ELTT1100

**Corequisite(s):** ELTT1220

**ELTT1220 | Digital & Microprocessors Theory | Lecture (8 Credits)**  
Identification, recognition and calculations associated with combinational and sequential logic circuits as well as internal architecture of microprocessors and microcontrollers, programming, logic operations, memory mapping, addressing, data transfer, and system control.

**Prerequisite(s):** ELTT1120  
**Corequisite(s):** ELTT1200 ELTT1210

**MATH1000 | Algebra & Trigonometry | Lecture (3 Credits)**  
Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations; trigonometric functions, solutions of triangles, radians, trig functions graphs, vectors, and basic identities.

**General Education:** Mathematics

# Engineering Drafting & Design (MDES), AAS

The Engineering Drafting & Design program provides students with the entry-level skills and theoretical knowledge to engineer and design products utilizing the latest technology in CAD/CAM software. Graduates from this program are prepared to enter the industry as mechanical designers, drafters, CAD/CAM technicians, quality inspectors, and tool designers. The course of study includes: print reading; machine tool applications; measurement and materials; job planning and layout; CAD/CAM software; solid modeling; finite element analysis; transmission of power; and 3D prototyping.

Students spend a significant amount of time in the machine shop and metrology lab gaining hands-on manufacturing skills to help them understand the realities of 21st century manufacturing. Students obtain Certified Solidworks Associate (CSWA) certification as part of their course of study. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

**Credential Earned:** AAS  
**Length of Program:** 2 years (4 semesters)  
**Classes Offered:** Day  
**Available Starts:** Fall Semester  
**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Demonstrate required industry safety standards.
- Create professional documentation using appropriate methods.
- Develop a relationship between fit, form and function using ergonomics to ensure a working product.
- Initiate problem-solving skills and techniques to develop manufacturing related solutions.
- Explore cultural and environmental issues related to manufacturing.
- Demonstrate proper use of manufacturing equipment.
- Perform objectives required of an industry-based capstone project.

## Degree Requirements

Code	Title	Credits
General Requirements		
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1350	Concepts of Calculus	3
Communications		3
Diversity		2
Humanities		3
Natural Sciences		3
Social Sciences		3
Technical Requirements		
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4
MDES1210	Process & Tool Design Lab	5
MDES1230	Geometric Dimensioning & Tolerances	4
MDES2130	Advanced SolidWorks	4
MDES2110	Product Design Lab	5
MDES2120	Product Design Theory	4
MDES2230	Statics & Strength of Materials	4
MDES1220	Creo Parametric	4
MDES2210	Transmission of Power Lab	5
MDES2220	Transmission of Power Theory	4
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
First Year		
Fall		
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		16
Total Credits		16
Spring		
MDES1210	Process & Tool Design Lab	5
MDES1230	Geometric Dimensioning & Tolerances	4
MDES2130	Advanced SolidWorks	4
MATH1350	Concepts of Calculus	3

Communications		3
	Credits	19
	Total Credits	19
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Fall</b>		
MDES2110	Product Design Lab	5
MDES2120	Product Design Theory	4
MDES2230	Statics & Strength of Materials	4
Humanities		3
Social Sciences		3
	Credits	19
	Total Credits	19
<b>Course</b>	<b>Title</b>	<b>Credits</b>
<b>Second Year</b>		
<b>Spring</b>		
MDES1220	Creo Parametric	4
MDES2210	Transmission of Power Lab	5
MDES2220	Transmission of Power Theory	4
Diversity		2
Natural Sciences		3
	Credits	18
	Total Credits	18

## Courses

### Course Descriptions

#### **MACH1110 | Machine Tool Fundamentals Lab | Laboratory (5 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1120

#### **MACH1120 | Machine Tool Fundamentals Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1110

#### **MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)**

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

#### **MDES1210 | Process & Tool Design Lab | Laboratory (5 Credits)**

Distinguish modern manufacturing processes such as molding, welding, heat treating, and machining; identify typical materials, tools, and required equipment. Analysis of process-specific capabilities such as tolerance, surface finish, cost effectiveness, and geometry restrictions.

**Prerequisite(s):** MACH1110

**Corequisite(s):** MDES1230

#### **MDES1230 | Geometric Dimensioning & Tolerances | Lecture (4 Credits)**

Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MDES1210

#### **MDES2130 | Advanced SolidWorks | Lecture (4 Credits)**

Simulation (Finite Element Analysis) and advanced surface modeling techniques. Culminates in testing for CSWA certification.

**Prerequisite(s):** MDES1110

#### **MDES2110 | Product Design Lab | Laboratory (5 Credits)**

Introduction to product design methods and concepts; converting product ideas and requirements into working designs. Design balance and relation to concepts such as aesthetics, performance, ergonomics and manufacturability.

**Prerequisite(s):** MDES1210

**Corequisite(s):** MDES2120

#### **MDES2120 | Product Design Theory | Lecture (4 Credits)**

Integrate methods and concepts of product design to actual designs of simple products. Determine design parameters, develop product opinions, narrow the focus for balance, and document the final design.

**Prerequisite(s):** MDES1220

**Corequisite(s):** MDES2110

#### **MDES2230 | Statics & Strength of Materials | Lecture (4 Credits)**

Fundamentals of statics and strength of materials. Development of techniques and mathematical methods used in design. Problem solving includes statics, direct stress, strength of materials, indirect stress, torsional stress and combined stress.

**Prerequisite(s):** MDES2130

#### **MDES1220 | Creo Parametric | Lecture (4 Credits)**

Create solid models, assemblies and engineering documentation using Creo Parametric. Apply fits and geometric dimensioning and tolerancing to models and drawings.

**Prerequisite(s):** MDES1110

#### **MDES2210 | Transmission of Power Lab | Laboratory (5 Credits)**

Design and draw projects with applications of gears, chains, bearings, cams, motors, clutches, cylinders, fluid and mechanical power transmission, robots and automation. Design resolution incorporating; project management, project selection, product design, calculations, design analysis, documentation, technical communications, quality and presentation.

**Prerequisite(s):** MDES2110

**Corequisite(s):** MDES2220

#### **MDES2220 | Transmission of Power Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with components of machines; mechanical and fluid power transmission, motors, clutches, gears, chains, bearings, cams, robots and automation. Design resolution incorporating; project management, project selection, product design, calculations, design analysis, documentation, technical communications, quality and presentation.

**Prerequisite(s):** MDES2120

**Corequisite(s):** MDES2210

#### **MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics



**MATH1350 | Concepts of Calculus | Lecture (3 Credits)**  
Systems and graphs of linear and quadratic equations, functions, limits, differentiation, implicit differentiation, related rates, integration; applications of the derivative and integral.  
**General Education:** Mathematics

# Industrial Controls & Robotics (ICON), AAS

The Industrial Controls & Robotics program provides evening students with the entry-level skills and theoretical knowledge to maintain the latest in automated manufacturing, packaging, and industrial robotic systems. Graduates from this program are prepared to enter the industry as machine designers, machine assemblers, electromechanical technicians, maintenance mechanics, and field service technicians.

The course of study includes: basic electricity and electronics, mechanical systems, electronic sensors, programmable logic controllers (PLCs), industrial robotics, motion-control systems, and advanced packaging and manufacturing systems.

The program’s curriculum is aligned with standards set forth by the Packaging Machinery Manufacturers Institute (PMMI), the Institute of Packaging Professionals (IoPP), the Robotics Industry Association (RIA), the National Fire Protection Association (NFPA), and the Instrumentation Society of America (ISA) as well as other national trade organizations. Arts & Sciences curriculum supports the technical coursework by enhancing the students’ communication, mathematics, and critical thinking skills. A shorter certificate option is also available.

**Credential Earned:** AAS  
**Length of Program:** 2 years (4 semesters)  
**Classes Offered:** Evening  
**Available Starts:** Fall Semester; Spring Semester  
**Bachelor’s Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.
- Explain the operation of electronic devices.
- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics and mechanical prints.
- Perform maintenance on mechanical systems.
- Commission and maintain industrial control systems.
- Commission and maintain industrial robots.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
General Requirements		
MATH1000	Algebra & Trigonometry	3
MATH1250	Boolean Algebra	3
Communications		3

Diversity		2
Humanities		3
Social Sciences		3
General Electives		3
Technical Requirements		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
MACH1000	Machine Shop Fundamentals	2
MDES1110	Engineering Drawings with SolidWorks	4
ASRO1220	Mechanical Transmission of Power Theory	4
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
ASRO2200	Automation & Robotics Lab	2
ASRO2205	Automation & Robotics Theory	8
Total Credits		60

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student’s schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
First Year		
Fall		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1000	Algebra & Trigonometry	3
	Credits	13
	Total Credits	13

Course	Title	Credits
First Year		
Spring		
MACH1000	Machine Shop Fundamentals	2
MDES1110	Engineering Drawings with SolidWorks	4
ASRO1220	Mechanical Transmission of Power Theory	4
MATH1250	Boolean Algebra	3
General Electives		3
	Credits	16
	Total Credits	16

Course	Title	Credits
Second Year		
Fall		
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
Communications		3
Social Sciences		3
	Credits	16
	Total Credits	16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
ASRO2200	Automation & Robotics Lab	2
ASRO2205	Automation & Robotics Theory	8
Diversity		2
Humanities		3
Credits		15
Total Credits		15

## Courses

### Course Descriptions

#### ELTT1100 | Basic Electricity & Electronics Lab | Laboratory (2 Credits)

Analyze, design, and build series, parallel and combination AC and DC circuits. Build and test semiconductor circuits, power supplies, transistor circuits using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

#### ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

#### MACH1000 | Machine Shop Fundamentals | Laboratory (2 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

#### MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

#### ASRO1220 | Mechanical Transmission of Power Theory | Lecture (4 Credits)

Identification, recognition and calculations associated with various components of machines including bearings, gears, cams, motors, clutches, cylinders (hydraulic and pneumatic), fluid systems, mechanical systems and other automation related components.

#### ASRO2100 | Industrial Controls & PLCs Lab | Laboratory (2 Credits)

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

#### ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

#### ASRO2200 | Automation & Robotics Lab | Laboratory (2 Credits)

Set up, configuration, programming and troubleshooting industrial robots to meet industry standards. Configuration and troubleshooting of installed automation and packaging equipment using machine schematics and related documentation.

**Prerequisite(s):** ASRO2100

**Corequisite(s):** ASRO2205

#### ASRO2205 | Automation & Robotics Theory | Lecture (8 Credits)

Identification, recognition, programming and calculations associated with automation and packaging components, motion control, industrial robotics and related documentation.

**Prerequisite(s):** ASRO2120

**Corequisite(s):** ASRO2200

#### MATH1000 | Algebra & Trigonometry | Lecture (3 Credits)

Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations; trigonometric functions, solutions of triangles, radians, trig functions graphs, vectors, and basic identities.

**General Education:** Mathematics

#### MATH1250 | Boolean Algebra | Lecture (3 Credits)

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

## Industrial Controls (ICOT), Certificate Overview

The Industrial Controls certificate provides evening students with the entry-level skills and theoretical knowledge to wire and program the latest programmable logic controllers (PLCs), human machine interfaces (HMIs) and motor controls. Graduates from this program are prepared to enter the industry as programmers, control system designers, panel builders, maintenance mechanics and field service technicians. The course of study includes: basic electricity and electronics; electronic sensors; programmable logic controllers (PLCs); human machine interface (HMIs); motion-control systems; and motor controllers. The program's curriculum is aligned with standards set forth by the Packaging Machinery Manufacturers Institute (PMMI), the Institute of Packaging Professionals (IoPP) and the National Fire Protection Association (NFPA). Students may choose to utilize these credits to continue on for an AAS degree in either Industrial Controls & Robotics or Electronics Technology. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics and critical thinking skills.

Credits earned in the Industrial Controls certificate directly transfer into Dunwoody's Industrial Controls & Robotics (ICON) (p. 90), Automated Systems & Robotics (ASRO) (p. 80), or Electronics Technology (IELT) (p. 85) associate's degree programs.

**Credential Earned:** Certificate

**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

## Program Outcomes

### Program Outcomes:

- Apply the concepts of basic electricity.
- Demonstrate required industry safety standards.

- Troubleshoot circuits and systems using industry standard test equipment.
- Analyze electrical schematics.
- Commission and maintain industrial control systems.

## Degree Requirements

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1000	Algebra & Trigonometry	3
<b>Technical Requirements</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
Total Credits		23

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
ELTT1100	Basic Electricity & Electronics Lab	2
ELTT1120	Basic Electricity & Electronics Theory	8
MATH1000	Algebra & Trigonometry	3
Credits		13
Total Credits		13
<b>Spring</b>		
ASRO2100	Industrial Controls & PLCs Lab	2
ASRO2120	Industrial Controls & PLCs Theory	8
Credits		10
Total Credits		10

## Courses

### Course Descriptions

#### ELTT1100 | Basic Electricity & Electronics Lab | Laboratory (2 Credits)

Analyze, design, and build series, parallel and combination AC and DC circuits. Build and test semiconductor circuits, power supplies, transistor circuits using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

#### ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

#### ASRO2100 | Industrial Controls & PLCs Lab | Laboratory (2 Credits)

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

#### ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

#### MATH1000 | Algebra & Trigonometry | Lecture (3 Credits)

Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations; trigonometric functions, solutions of triangles, radians, trig functions graphs, vectors, and basic identities.

**General Education:** Mathematics

## Machine Tool Technology (MACH), AAS

The Machine Tool Technology program provides students with entry-level skills and theoretical knowledge to program and operate all of the latest machine tools utilized in modern manufacturing facilities. Graduates from this program are prepared to enter the industry as machine operators, production machinists, CAD/CAM technicians, CNC programmers, and tool designers.

The course of study includes: manual milling and turning; measurement and materials; job planning and layout; CAD/CAM software; CNC milling and turning; mold and die making; and EDM technology. The program's curriculum is closely aligned with standards set forth by National Institute of Metalworking Skills (NIMS).

Due to high demand, most machine tool students can find full-time employment in the field long before graduation and many will be working in a shop within just the first year of the program. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

**Credential Earned:** AAS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

**Accreditation:** NIMS (National Institute for Metalworking Skills)

**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

## Program Outcomes

### Program Outcomes:

- Demonstrate required industry safety standards.
- Create professional documentation using appropriate methods.
- Develop a relationship between fit, form and function using ergonomics to ensure a working product.
- Initiate problem-solving skills and techniques to develop manufacturing related solutions.
- Explore cultural and environmental issues related to manufacturing.
- Demonstrate proper use of manufacturing equipment.
- Perform objectives required of an industry-based capstone project.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1200	Machine Math	3
Communications		3
Diversity		2
Humanities		3
Natural Sciences		3
Social Sciences		3
<b>Technical Requirements</b>		
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4
MACH1210	Advanced Machining Lab	5
MACH1220	Advanced Machining Theory	4
MDES1230	Geometric Dimensioning & Tolerances	4
MACH2210	CNC Mill, EDM & Die Making Lab	5
MACH2220	CNC Mill & EDM Theory	2
MACH2230	Die Design Theory	2
MACH2140	MasterCAM I	4
MACH2110	CNC Lathe, Mill & Mold Making Lab	5
MACH2120	CNC Lathe & Mill Theory	2
MACH2130	Mold Design Theory	2
MACH2240	MasterCAM II	4
Total Credits		72

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
MACH1210	Advanced Machining Lab	5
MACH1220	Advanced Machining Theory	4
MDES1230	Geometric Dimensioning & Tolerances	4
MATH1200	Machine Math	3
Communications		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
MACH2210	CNC Mill, EDM & Die Making Lab	5
MACH2220	CNC Mill & EDM Theory	2
MACH2230	Die Design Theory	2
MACH2140	MasterCAM I	4
Humanities		3
Social Sciences		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
MACH2110	CNC Lathe, Mill & Mold Making Lab	5
MACH2120	CNC Lathe & Mill Theory	2
MACH2130	Mold Design Theory	2
MACH2240	MasterCAM II	4
Diversity		2
Natural Sciences		3
Credits		18
Total Credits		18

## Courses

### Course Descriptions

#### MACH1110 | Machine Tool Fundamentals Lab | Laboratory (5 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1120

**MACH1120 | Machine Tool Fundamentals Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1110

**MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)**

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

**MACH1210 | Advanced Machining Lab | Laboratory (5 Credits)**

Advanced manufacturing of parts through layout, bench work and job planning. Advanced manual turning and milling and an introduction to CNC M & G codes. CNC portion includes manual programming via machine control and software simulation.

**Prerequisite(s):** MACH1110

**Corequisite(s):** MACH1220

**MACH1220 | Advanced Machining Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with advanced milling and turning operations, inspection of finished parts and an introduction to the G & M codes used in CNC programming. CNC portion includes manual programming in notepad and Immersive software simulation.

**Prerequisite(s):** MACH1120

**Corequisite(s):** MACH1210

**MDES1230 | Geometric Dimensioning & Tolerances | Lecture (4 Credits)**

Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MDES1210

**MACH2210 | CNC Mill, EDM & Die Making Lab | Laboratory (5 Credits)**

Advanced manufacturing processes using CNC lathe, CNC mill, wire EDM and sinker EDM. Design and build a complete blanking die, along with hand and inspection tool techniques to ensure proper fits and finishes. Explore the set up and operation of 4 axis machine tool.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MACH2220

**MACH2220 | CNC Mill & EDM Theory | Lecture (2 Credits)**

Advanced work holding principles, 4 axis CNC programming, axis definitions, wire EDM programming and power definitions.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MACH2210

**MACH2230 | Die Design Theory | Lecture (2 Credits)**

Die design fundamentals and components including bend tolerances, cutting clearances, tonnage calculations, forming, and fits and clearances for dies.

**MACH2140 | MasterCAM I | Lecture (4 Credits)**

2D and 3D geometry and surface model creation using MasterCAM software, an associative computer-aided manufacturing system for milling and turning. M and G code programs will be created, debugged and simulated cutter paths run for simple part geometries.

**Prerequisite(s):** MDES1110

**MACH2110 | CNC Lathe, Mill & Mold Making Lab | Laboratory (5 Credits)**

Advanced manufacturing processes using CNC lathes, CNC mill and EDM, design and build of an injection mold, along with hand and inspection tool techniques.

**Prerequisite(s):** MACH1210

**Corequisite(s):** MACH2120 MACH2130

**MACH2120 | CNC Lathe & Mill Theory | Lecture (2 Credits)**

Advanced CNC mill programming and introduction to CNC lathe programming. G & M codes, canned cycles, jigs, fixtures and work holding methods.

**Prerequisite(s):** MACH1220

**Corequisite(s):** MACH2110

**MACH2130 | Mold Design Theory | Lecture (2 Credits)**

Mold making methods and industry standard practices, history and uses. Design of one injection mold from concept to finished prints. Includes mold steels, press operation, molding cycle and inspection of finished parts.

**Prerequisite(s):** MACH1220

**Corequisite(s):** MACH2110

**MACH2240 | MasterCAM II | Lecture (4 Credits)**

Advanced 3D design, surface and solid model creation using MasterCAM. Tool path creation and posting for both 2D and 3D geometry including advanced surface and solid models. Lathe part creation and programming in 2D.

**Prerequisite(s):** MACH2140

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**MATH1200 | Machine Math | Lecture (3 Credits)**

Translation of engineering drawing dimensions to machine working dimensions. Integration of algebra, geometry and trigonometry to solve machine applications. Applications of compound angles.

**General Education:** Mathematics

## Right Skills Now for Manufacturing (CNC) (RSNM), Certificate

The Right Skills Now for Manufacturing (RSNM) certificate is designed to provide fast-track, high-skilled manufacturing training in the following areas: job planning, benchwork, materials, manual milling, manual turning, CNC milling, and CNC turning. This program was designed as a partnership between the President's Jobs Council, the manufacturing industry, and Dunwoody College to address the current shortage of CNC operators. Graduates from this program are prepared to enter the industry as entry-level manual and CNC machine tool operators.

The RSNM curriculum is closely aligned with standards set forth by National Institute of Metalworking Skills (NIMS). Students may choose to utilize these credits to continue on for an AAS Degree in Machine Tool Technology. Additional coursework in mathematics and career investigation rounds out the degree.

Credits earned in the Right Skills Now certificate directly transfer into Dunwoody's Machine Tool Technology (MACH) (p. 92), Engineering Drafting & Design (MDES) (p. 88), or Welding & Metal Fabrication (WMET) (p. 95) associate's degree programs.

**Credential Earned:** Certificate



**Length of Program:** 1 year (2 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** NIMS (National Institute for Metalworking Skills)

## Program Outcomes

### Program Outcomes:

- Demonstrate required industry safety standards.
- Demonstrate proper use of manufacturing equipment.
- Initiate problem-solving skills and techniques to develop manufacturing related solutions.
- Investigate manufacturing careers.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1200	Machine Math	3
<b>Technical Requirements</b>		
RSNM1100	Measurement, Materials & Safety	2
RSNM1110	Job Planning, Benchwork & Layout	2
RSNM1120	CNC Milling Level I	3
RSNM1130	CNC Turning Level I	3
RSNM1210	Manufacturing Careers Investigation	3
Total Credits		19

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
RSNM1100	Measurement, Materials & Safety	2
RSNM1110	Job Planning, Benchwork & Layout	2
RSNM1120	CNC Milling Level I	3
RSNM1130	CNC Turning Level I	3
MATH1050	Algebra, Trigonometry & Geometry	3
Credits		13
Total Credits		13

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
RSNM1210	Manufacturing Careers Investigation	3

MATH1200	Machine Math	3
Credits		6
Total Credits		6

## Courses

### Course Descriptions

#### RSNM1100 | Measurement, Materials & Safety | Lec/Lab (2 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes, and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table, and the many other milling and turning operations.

#### RSNM1110 | Job Planning, Benchwork & Layout | Lec/Lab (2 Credits)

An exploration of the basics of hand tools, understanding drawings, manual machines, and layout. Interpret drawing information, describe basic symbols and notation, and interpret basic GD&T feature control frames. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

#### RSNM1120 | CNC Milling Level I | Lec/Lab (3 Credits)

Introduction to basic milling operations. Examine manual and CNC milling practices. Utilize tooling, machining practices and applied mathematics. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

#### RSNM1130 | CNC Turning Level I | Lec/Lab (3 Credits)

Introduction to basic lathe operations. Examine manual and CNC lathe turning practices. Utilize tooling, machining practices and applied mathematics. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

#### RSNM1210 | Manufacturing Careers Investigation | Practicum (3 Credits)

Explore different manufacturing careers through several possible paths. Create resumes, explore job postings, attend a job fair, perform mock interviews and report weekly on your progress. Fulfill the course requirements by completing at least 162 hours in an industry-related internship, co-op or apprenticeship.

**Prerequisite(s):** RSNM1100, RSNM1110, RSNM1120, And RSNM1130

#### MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

#### MATH1200 | Machine Math | Lecture (3 Credits)

Translation of engineering drawing dimensions to machine working dimensions. Integration of algebra, geometry and trigonometry to solve machine applications. Applications of compound angles.

**General Education:** Mathematics

## Welding and Metal Fabrication (WMET), AAS

The Welding & Metal Fabrication program provides students with the unique opportunity to combine two highly skilled trades into one AAS degree by taking the one-year Welding Technology certificate and adding an additional year of training in Dunwoody's state-of-the-art machine shop. Students gain the entry-level skills and theoretical knowledge to machine parts, layout assemblies for fabrication, weld assemblies, and finish weldments utilizing various machine tools.

Graduates from this program are prepared to enter the industry as welders, fabricators, machinists, and machine operators. The course of study includes: manual milling and turning; measurement and materials; job planning and layout; metallurgy; oxygen-fuel welding and cutting; shielded metal arc welding (SMAW-stick); gas metal arc welding (GMAW-MIG); gas tungsten arc welding (GTAW-TIG); and the various fabrication processes.

The program's curriculum is closely aligned with standards set forth by National Institute of Metalworking Skills (NIMS) and the American Welding Society (AWS). Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills. A shorter certificate option is also available.

**Credential Earned:** AAS  
**Length of Program:** 2 years (4 semesters)  
**Classes Offered:** Day  
**Available Starts:** Fall Semester; Spring Semester  
**Bachelor's Completion Option(s):** Industrial Engineering Technology (IENG), Bachelor of Science (p. 101) | Business Management Leadership (AMGT), Bachelor of Science (p. 101)

Program Outcomes

Program Outcomes:

- Demonstrate knowledge and proper use of manual machine tools.
- Interpret blueprints and symbols.
- Demonstrate project management and problem solving skills.
- Demonstrate business communication skills.
- Demonstrate proper use of inspection equipment and hand tools.
- Program CNC equipment using M and G codes.
- Demonstrate required industry safety standards.
- Fabricate weldments using multiple processes and positions.
- Analyze weldments for quality.

Degree Requirements

Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
ARTS1350	Structural Drawing	3
MATH1050	Algebra, Trigonometry & Geometry	3
MATH1200	Machine Math	3
Communications		3
Communications (Writing)		3
Humanities		3
Social Sciences		2
<b>Technical Requirements</b>		
WELD1110	Introduction to Welding Lab	5
WELD1120	Introduction to Welding Theory	4
WELD1130	Welding Math, Prints & Symbols	4
WELD1210	Advanced Welding Lab	5
WELD1221	Advanced Welding Theory & Applications	8
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4

MACH1210	Advanced Machining Lab	5
MACH1220	Advanced Machining Theory	4
MDES1230	Geometric Dimensioning & Tolerances	4
Total Credits		72

Sample Academic Plan

Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
WELD1110	Introduction to Welding Lab	5
WELD1120	Introduction to Welding Theory	4
WELD1130	Welding Math, Prints & Symbols	4
ARTS1350	Structural Drawing	3
Credits		16
Total Credits		16

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
WELD1210	Advanced Welding Lab	5
WELD1221	Advanced Welding Theory & Applications	8
Communications		3
Social Sciences		2
Credits		18
Total Credits		18

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
MACH1110	Machine Tool Fundamentals Lab	5
MACH1120	Machine Tool Fundamentals Theory	4
MDES1110	Engineering Drawings with SolidWorks	4
MATH1050	Algebra, Trigonometry & Geometry	3
Humanities		3
Credits		19
Total Credits		19

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
MACH1210	Advanced Machining Lab	5
MACH1220	Advanced Machining Theory	4
MDES1230	Geometric Dimensioning & Tolerances	4
MATH1200	Machine Math	3
Communications (Writing)		3
Credits		19
Total Credits		19

## Courses

### Course Descriptions

#### **WELD1110 | Introduction to Welding Lab | Laboratory (5 Credits)**

Perform welding of standard joint designs on various thicknesses of steel plate. Practice oxyacetylene welding and cutting (OAW), stick welding (SMAW), and wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Demonstrate shop safety, setup and troubleshooting of welding equipment and applications.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1120 WELD1130

#### **WELD1120 | Introduction to Welding Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with weld joint designs and weld materials. Examine various weld processes: oxyacetylene welding and cutting (OAW), stick welding (SMAW), wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Examine shop safety, setup and troubleshooting of welding equipment and applications.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1110 WELD1130

#### **WELD1130 | Welding Math, Prints & Symbols | Lecture (4 Credits)**

Principles of weld print reading, measuring systems, decimal/fraction conversions, dimensioning, layout, orthographic views, technical math, and section views.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1110 WELD1120

#### **WELD1210 | Advanced Welding Lab | Laboratory (5 Credits)**

Practice welding of steel plate and aluminum alloys using stick welding (SMAW), wire feed welding (GMAW) and tungsten inert gas (TIG) welding. Demonstrate shop safety, grinding, finishing, and cutting practices in a final fabrication project.

**Prerequisite(s):** WELD1110

**Corequisite(s):** WELD1221

#### **WELD1221 | Advanced Welding Theory & Applications | Lecture (8 Credits)**

Identification, recognition, and calculations associated with weld joint designs and assemblies using various welding and metallurgic processes. Other topics include: material selection, layout, fixturing, weldment inspection and lean manufacturing. Culminates in a designed and fabricated project.

**Prerequisite(s):** WELD1120

**Corequisite(s):** WELD1210

#### **MACH1110 | Machine Tool Fundamentals Lab | Laboratory (5 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1120

#### **MACH1120 | Machine Tool Fundamentals Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1110

#### **MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)**

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

#### **MACH1210 | Advanced Machining Lab | Laboratory (5 Credits)**

Advanced manufacturing of parts through layout, bench work and job planning. Advanced manual turning and milling and an introduction to CNC M & G codes. CNC portion includes manual programming via machine control and software simulation.

**Prerequisite(s):** MACH1110

**Corequisite(s):** MACH1220

#### **MACH1220 | Advanced Machining Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with advanced milling and turning operations, inspection of finished parts and an introduction to the G & M codes used in CNC programming. CNC portion includes manual programming in notepad and Immersive software simulation.

**Prerequisite(s):** MACH1120

**Corequisite(s):** MACH1210

#### **MDES1230 | Geometric Dimensioning & Tolerances | Lecture (4 Credits)**

Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MDES1210

#### **ARTS1350 | Structural Drawing | Lecture (3 Credits)**

Basic drawing concepts and techniques are studied through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Working from observation and using line, tone and the rules of linear perspective to solve spatial, compositional and color/light problems and form a 3-dimensional illusion of space as it relates to human constructs.

**General Education:** Humanities

#### **MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

#### **MATH1200 | Machine Math | Lecture (3 Credits)**

Translation of engineering drawing dimensions to machine working dimensions. Integration of algebra, geometry and trigonometry to solve machine applications. Applications of compound angles.

**General Education:** Mathematics

## Welding Technology (WELD), Certificate

### Overview

The Welding Technology certificate provides students with entry-level skills and theoretical knowledge to perform the various welding, cutting and fabrication processes required in a 21st century manufacturing facility. Graduates from this program are prepared to enter the industry as welders, fabricators, fitters and inspectors. The course of study includes: print reading; weld symbols; measurement and materials; job planning and layout; and metallurgy. Welding techniques instructed include oxygen-fuel welding and cutting; shielded metal arc welding (SMAW-stick); gas metal arc welding (GMAW-MIG); gas tungsten arc welding (GTAW-TIG) and various fabrication processes. The program's curriculum

is closely aligned with standards set forth by American Welding Society (AWS). Students may choose to utilize these credits to continue on for an AAS Degree in Welding & Metal Fabrication. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics and critical thinking skills.

Credits earned in the Welding Technology certificate directly transfer into Dunwoody's Welding & Metal Fabrication (WMET) (p. 95) associate's degree program.

**Credential Earned:** Certificate  
**Length of Program:** 1 year (2 semesters)  
**Classes Offered:** Day  
**Available Starts:** Fall Semester; Spring Semester

Program Outcomes

Program Outcomes:

- Demonstrate required industry safety standards.
- Interpret welding blueprints and symbols.
- Fabricate weldments using multiple processes and positions.
- Analyze weldments for quality.

Degree Requirements

Degree Requirements

Code	Title	Credits
General Requirements		
ARTS1350	Structural Drawing	3
Communications		3
Technical Requirements		
WELD1110	Introduction to Welding Lab	5
WELD1120	Introduction to Welding Theory	4
WELD1130	Welding Math, Prints & Symbols	4
WELD1210	Advanced Welding Lab	5
WELD1221	Advanced Welding Theory & Applications	8
Total Credits		32

Sample Academic Plan

Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
First Year		
Fall		
WELD1110	Introduction to Welding Lab	5
WELD1120	Introduction to Welding Theory	4
WELD1130	Welding Math, Prints & Symbols	4

ARTS1350	Structural Drawing	3
	Credits	16
	Total Credits	16
Course Title Credits		
First Year		
Spring		
WELD1210	Advanced Welding Lab	5
WELD1221	Advanced Welding Theory & Applications	8
Communications		3
Credits		16
Total Credits		16

Courses

Course Descriptions

**WELD1110 | Introduction to Welding Lab | Laboratory (5 Credits)**  
Perform welding of standard joint designs on various thicknesses of steel plate. Practice oxyacetylene welding and cutting (OAW), stick welding (SMAW), and wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Demonstrate shop safety, setup and troubleshooting of welding equipment and applications.  
**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230  
**Corequisite(s):** WELD1120 WELD1130

**WELD1120 | Introduction to Welding Theory | Lecture (4 Credits)**  
Identification, recognition and calculations associated with weld joint designs and weld materials. Examine various weld processes: oxyacetylene welding and cutting (OAW), stick welding (SMAW), wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Examine shop safety, setup and troubleshooting of welding equipment and applications.  
**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230  
**Corequisite(s):** WELD1110 WELD1130

**WELD1130 | Welding Math, Prints & Symbols | Lecture (4 Credits)**  
Principles of weld print reading, measuring systems, decimal/fraction conversions, dimensioning, layout, orthographic views, technical math, and section views.  
**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230  
**Corequisite(s):** WELD1110 WELD1120

**WELD1210 | Advanced Welding Lab | Laboratory (5 Credits)**  
Practice welding of steel plate and aluminum alloys using stick welding (SMAW), wire feed welding (GMAW) and tungsten inert gas (TIG) welding. Demonstrate shop safety, grinding, finishing, and cutting practices in a final fabrication project.  
**Prerequisite(s):** WELD1110  
**Corequisite(s):** WELD1221

**WELD1221 | Advanced Welding Theory & Applications | Lecture (8 Credits)**  
Identification, recognition, and calculations associated with weld joint designs and assemblies using various welding and metallurgic processes. Other topics include: material selection, layout, fixturing, weldment inspection and lean manufacturing. Culminates in a designed and fabricated project.  
**Prerequisite(s):** WELD1120  
**Corequisite(s):** WELD1210

**ARTS1350 | Structural Drawing | Lecture (3 Credits)**

Basic drawing concepts and techniques are studied through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Working from observation and using line, tone and the rules of linear perspective to solve spatial, compositional and color/light problems and form a 3-dimensional illusion of space as it relates to human constructs.

**General Education:** Humanities

## School of Engineering

- Electrical Engineering (EENG), Bachelor of Science (p. 99)
- Industrial Engineering Technology (IENG), Bachelor of Science (p. 101)
- Mechanical Engineering (MENG), Bachelor of Science (p. 104)
- Software Engineering (SENG), Bachelor of Science (p. 108)

## Electrical Engineering (EENG)

The Electrical Engineering bachelor's degree prepares students to enter the field of engineering as electrical engineers and work to solve many of the problems facing our society. Graduates can find employment in a variety of industries, including energy, construction, medical, telecommunications, transportation, and computing.

Students learn to apply engineering principles to the work environment, how to work collaboratively in a team environment, and how to create electrical or electronic systems that are effective and efficient. Coursework includes study in electronics, mechatronics, signals and system theory, power systems, and semiconductors. Curriculum is project-based so that theoretical engineering principles are reinforced and experienced through hands-on creation and problem-solving.

Arts & Sciences courses help students understand the core mathematical and scientific principles that all engineering projects grow out of as well as provide students with the communication and critical thinking skills required to succeed in the profession.

All students complete a senior project or internship. Graduates are prepared to pass the Fundamentals of Engineering Exam should they wish to take that first step in becoming licensed professional engineers (PE).

**Length of Program:** 4 years (8 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must

consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
CHEM2110	Chemistry with Lab	4
COMM3000	Professional Communication	2
ENGL1010	English	3
HUMN4000	Ethical Decision-Making	2
MATH1811	Calculus I	4
MATH1821	Calculus II	4
MATH2260	Probability & Statistics	4
MATH2810	Multi-Variable Calculus	4
MATH2820	Linear Algebra & Differential Equations	4
PHYS1800	Physics I with Lab	4
PHYS1820	Physics II with Lab	4
WRIT2010	Technical Writing	3
Diversity		2
Humanities		3
Upper Social Sciences		2
<b>Technical Requirements</b>		
MENG1120	Introduction to Engineering	3
EENG1110	Programming for Electrical Engineers	3
EENG1210	Logic & Digital Design	2
EENG1220	Logic & Digital Design Lab	1
EENG1230	Circuit Fundamentals I	2
EENG2110	Circuit Fundamentals II	2
EENG2120	Circuit Fundamentals II Lab	1
EENG2130	Digital Systems	3
EENG2210	Analog Circuits	3
EENG2220	Analog Circuits Lab	1
EENG2230	Semiconductor Fundamentals	4
EENG3110	Advanced Analog Circuits	3
EENG3120	Advanced Analog Circuits Lab	1
EENG3130	Signals & Systems Theory	4
EENG3140	Electrodynamics I	3
EENG3210	Advanced Digital Systems	4
EENG3220	Advanced Digital SystAdv Digital Sys Lab	1
EENG3230	Electrodynamics II	3
EENG3240	Mechatronics	4
EENG3250	Mechatronics Lab	1
EENG4110	Communication Systems I	3
EENG4120	Communication Systems I Lab	1



MENG4230	Engineering Economics	2
EENG4140	Power System Analysis	3
EENG4150	Senior Design Project I	2
EENG4210	Biomedical Topics	2
EENG4220	Biomedical Topics Lab	1
EENG4230	Communication Systems II	3
EENG4240	Power System Design	3
EENG4250	Senior Design Project II	4
Total Credits		122

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MENG1120	Introduction to Engineering	3
EENG1110	Programming for Electrical Engineers	3
MATH1811	Calculus I	4
PHYS1800	Physics I with Lab	4
ENGL1010	English	3
Credits		17
Total Credits		17

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
EENG1210	Logic & Digital Design	2
EENG1220	Logic & Digital Design Lab	1
EENG1230	Circuit Fundamentals I	2
MATH1821	Calculus II	4
PHYS1820	Physics II with Lab	4
Diversity		2
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
EENG2110	Circuit Fundamentals II	2
EENG2120	Circuit Fundamentals II Lab	1
EENG2130	Digital Systems	3
MATH2820	Linear Algebra & Differential Equations	4
CHEM2110	Chemistry with Lab	4
Humanities		3
Credits		17
Total Credits		17

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
EENG2210	Analog Circuits	3
EENG2220	Analog Circuits Lab	1
EENG2230	Semiconductor Fundamentals	4
MATH2810	Multi-Variable Calculus	4
WRIT2010	Technical Writing	3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Third Year</b>		
<b>Fall</b>		
EENG3210	Advanced Digital Systems	4
EENG3120	Advanced Analog Circuits Lab	1
EENG3130	Signals & Systems Theory	4
EENG3140	Electrodynamics I	3
MATH2260	Probability & Statistics	4
Credits		16
Total Credits		16

Course	Title	Credits
<b>Third Year</b>		
<b>Spring</b>		
EENG3210	Advanced Digital Systems	4
EENG3220	Advanced Digital SystAdv Digital Sys Lab	1
EENG3230	Electrodynamics II	3
EENG3240	Mechatronics	4
EENG3250	Mechatronics Lab	1
Upper Social Sciences		2
Credits		15
Total Credits		15

Course	Title	Credits
<b>Fourth Year</b>		
<b>Fall</b>		
EENG4110	Communication Systems I	3
EENG4120	Communication Systems I Lab	1
EENG4230	Communication Systems II	3
EENG4140	Power System Analysis	3
EENG4150	Senior Design Project I	2
COMM3000	Professional Communication	2
Credits		14
Total Credits		14

Course	Title	Credits
<b>Fourth Year</b>		
<b>Spring</b>		
EENG4210	Biomedical Topics	2
EENG4220	Biomedical Topics Lab	1
EENG4230	Communication Systems II	3
EENG4240	Power System Design	3
EENG4250	Senior Design Project II	4
HUMN4000	Ethical Decision-Making	2
Credits		15
Total Credits		15

## Courses

### Course Descriptions

Code	Title	Credits
MENG1120	Introduction to Engineering	3
EENG1110	Programming for Electrical Engineers	3
EENG1210	Logic & Digital Design	2
EENG1220	Logic & Digital Design Lab	1
EENG1230	Circuit Fundamentals I	2
EENG2110	Circuit Fundamentals II	2
EENG2120	Circuit Fundamentals II Lab	1
EENG2130	Digital Systems	3
EENG2210	Analog Circuits	3
EENG2220	Analog Circuits Lab	1
EENG2230	Semiconductor Fundamentals	4
EENG3110	Advanced Analog Circuits	3
EENG3120	Advanced Analog Circuits Lab	1
EENG3130	Signals & Systems Theory	4
EENG3140	Electrodynamics I	3
EENG3210	Advanced Digital Systems	4
EENG3220	Advanced Digital SystAdv Digital Sys Lab	1
EENG3230	Electrodynamics II	3
EENG3240	Mechatronics	4
EENG3250	Mechatronics Lab	1
EENG4110	Communication Systems I	3
EENG4120	Communication Systems I Lab	1
MENG4230	Engineering Economics	2
EENG4140	Power System Analysis	3
EENG4150	Senior Design Project I	2
EENG4210	Biomedical Topics	2
EENG4220	Biomedical Topics Lab	1
EENG4230	Communication Systems II	3
EENG4240	Power System Design	3
EENG4250	Senior Design Project II	4
MATH1811	Calculus I	4
PHYS1800	Physics I with Lab	4
ENGL1010	English	3
MATH1821	Calculus II	4
PHYS1820	Physics II with Lab	4
MATH2820	Linear Algebra & Differential Equations	4
CHEM2110	Chemistry with Lab	4
MATH2810	Multi-Variable Calculus	4
WRIT2010	Technical Writing	3
MATH2260	Probability & Statistics	4
COMM3000	Professional Communication	2
HUMN4000	Ethical Decision-Making	2

## Industrial Engineering Technology (IENG), Bachelor of Science

The Industrial Engineering Technology program provides a bachelor's completion degree option with the skills and theoretical knowledge needed to advance graduates into engineering and management

positions in their respective industries. Graduates from this program will be prepared to take on new roles such as: industrial engineer, manufacturing engineer, quality engineer, and process engineer.

Students learn how to apply engineering principles to the work environment, how to work collaboratively in a team environment, and how to use tools and data to anticipate and solve issues in the engineering process. Coursework includes study in manufacturing processes and industrial automation, work methods and design, quality and lean, management, and ethics and social responsibility.

Curriculum is project-based so that theoretical engineering principles are reinforced and experienced through hands-on creation and problem-solving. Arts & Sciences courses help students understand the core mathematical and scientific principles which are the foundation of engineering theory, and provide students with the communication and critical thinking skills required to succeed in the profession.

The program also incorporates a senior capstone project in its final semester that gives students the chance to demonstrate real-world industrial engineering experience. Arts & Sciences curriculum supports the technical coursework by enhancing the students' communication, mathematics, and critical thinking skills.

**Credential Earned:** BS

**Length of Program:** 2 years (4 semesters)

**Classes Offered:** Evening

**Available Starts:** Fall Semester; Spring Semester

**Accreditation:** Engineering Technology Accreditation Commission (ETAC) of ABET

## Program Outcomes

### Program Outcomes:

- An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.
- An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
- An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.
- An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.
- An ability to function effectively as a member or leader on a technical team.
- An ability to identify, analyze, and solve broadly-defined engineering technology problems.
- An ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.
- An understanding of the need for and an ability to engage in self-directed continuing professional development.
- An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.

- A knowledge of the impact of engineering technology solutions in a societal and global context.
- A commitment to quality, timeliness, and continuous improvement.

## Degree Requirements

## Degree Requirements

Admitted students to Industrial Engineering Technology (IENG) can transfer up to 45 technical and 20 Arts & Sciences credits. A transfer evaluation is required. Not all credits may transfer into the degree program.

Code	Title	Credits
<b>Transfer Credits</b>		65
<b>General Requirements</b>		
MATH1700	Pre Calculus	3
MATH1810	Calculus I	3
MATH1820	Calculus II	3
PHYS1810	Calculus-Based Physics	3
WRIT4020	Capstone Technical Writing	2
Upper Communications		2
Upper Humanities		2
Upper Social Sciences		2
<b>Technical Requirements</b>		
IENG1120	Introduction to Engineering	2
IENG3115	Statistical Quality Control	2
IENG3145	Ethics & Social Responsibility for Eng	2
IENG3150	Manufacturing Processes with Lab	3
IENG3215	Project Management	2
IENG3235	Quality Systems	2
IENG3250	Lean Systems with Lab	3
IENG4111	Ergonomics & Work Measurement	3
IENG4115	Supply Chain Management	2
IENG4125	Production Planning & Control	2
IENG4135	Operations Management	2
IENG4145	Engineering Economic Analysis	2
IENG4210	Simulation Modeling and Analysis	3
IENG4250	Industrial Automation with Lab	3
IENG4295	Senior Capstone	4
Total Credits		122

## Sample Academic Plan

## Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
IENG1120	Introduction to Engineering	2
IENG3115	Statistical Quality Control	2
IENG3145	Ethics & Social Responsibility for Eng	2
IENG3150	Manufacturing Processes with Lab	3
MATH1700	Pre Calculus	3
Upper Communications		2
Credits		14
Total Credits		14

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
IENG3215	Project Management	2
IENG3235	Quality Systems	2
IENG3250	Lean Systems with Lab	3
MATH1810	Calculus I	3
WRIT4020	Capstone Technical Writing	2
Upper Humanities		2
Credits		14
Total Credits		14

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
IENG4111	Ergonomics & Work Measurement	3
IENG4115	Supply Chain Management	2
IENG4125	Production Planning & Control	2
IENG4135	Operations Management	2
IENG4145	Engineering Economic Analysis	2
MATH1820	Calculus II	3
Credits		14
Total Credits		14

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
IENG4210	Simulation Modeling and Analysis	3
IENG4250	Industrial Automation with Lab	3
IENG4295	Senior Capstone	4
PHYS1810	Calculus-Based Physics	3
Upper Social Sciences		2
Credits		15
Total Credits		15

## Courses

## Course Descriptions

**IENG1120 | Introduction to Engineering | Lecture (2 Credits)**  
Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

**IENG3115 | Statistical Quality Control | Lecture (2 Credits)**  
Apply statistical methods to study the quality of products and services, determining how to reduce the time required to produce the product and ensure the quality of the product. Topics include probability and statistics, control charts, acceptance criteria and sampling, and case studies.

**IENG3150 | Manufacturing Processes with Lab | Lec/Lab (3 Credits)**

Examine and apply various manufacturing processes and materials used in product development and manufacturing. Each process is covered from a technical perspective, with an emphasis placed on how multiple processes can be linked together. Several manufacturing processes, such as computer aided design, machining, welding, and electronics are used to design a product.

**IENG3145 | Ethics & Social Responsibility for Eng | Lecture (2 Credits)**

The theory and application of ethics and social responsibility as it applies to engineering practice. Topics include engineering ethics codes, cultural and diversity issues, environmental concerns, and intellectual property.

**IENG3215 | Project Management | Lecture (2 Credits)**

Examine the methods and tools used for effective management of engineering projects. Topics include the analytical methods used to budget, schedule, and control projects, as well as risk management, team leadership, and communication.

**IENG3235 | Quality Systems | Lecture (2 Credits)**

Investigate several quality concepts used to improve quality and customer satisfaction. Topics include principle concepts of quality management: customer, process, and workforce focuses; international standards; concurrent engineering; and performance for excellence, strategy, and knowledge management.

**Prerequisite(s):** IENG3115

**IENG3250 | Lean Systems with Lab | Lec/Lab (3 Credits)**

Investigate the history and evolution of lean systems and current day applications to manufacturing, service, and business. Apply fundamental lean philosophies and tools to manufacturing, service, and business. Understand the role of culture transformation and change management techniques in the application of lean tools.

**IENG4111 | Ergonomics & Work Measurement | Lecture (3 Credits)**

Introduction to ergonomics as applied to the human-machine interface, as well as the fundamental concepts behind work design, with emphasis on measuring work and analyzing work methods. Topics include methods engineering and analysis, time and motion studies, and workplace design considering physical and cognitive ergonomic principles.

**IENG4115 | Supply Chain Management | Lecture (2 Credits)**

Explain the fundamentals of supply chain management. Topics include the supply chain network, system integration, supply chain strategies, and challenges in managing the supply chain.

**IENG4125 | Production Planning & Control | Lecture (2 Credits)**

Utilize aspects of management to maximize productivity in a factory or service environment. Topics include sales & operations planning, inventory and capacity management, material requirements planning, and the theory of constraints.

**Prerequisite(s):** MATH1810

**IENG4135 | Operations Management | Lecture (2 Credits)**

Explain the planning, organization, coordination, and control of the resources needed to produce a company's goods and services. Topics include strategy alignment, capacity planning, aggregate plans, and the importance of work place safety.

**IENG4145 | Engineering Economic Analysis | Lecture (2 Credits)**

The concepts of finance and economics within the engineering environment. Analyze costs, risk, funding options, economic return on investment, and legal and environmental concerns.

**Prerequisite(s):** MATH1810

**IENG4210 | Simulation Modeling and Analysis | Lecture (3 Credits)**

Utilize simulation to create, analyze, and evaluate realistic models of real-world environments. Topics include Monte Carlo simulation, queuing theory, selecting input distributions, animation in simulation, and evaluating simulation output.

**Prerequisite(s):** MATH1810

**IENG4250 | Industrial Automation with Lab | Lec/Lab (3 Credits)**

Investigate and apply several automated processes used in manufacturing, service, and business processes. Topics include automated work systems, safety, and design of systems.

**Prerequisite(s):** MATH1820

**IENG4295 | Senior Capstone | Practicum (4 Credits)**

Demonstrate overall content knowledge of the program outcomes through a major project. Conduct a final presentation of the project and explain how it applies to the engineering program outcomes.

**Prerequisite(s):** WRIT4020

**MATH1700 | Pre Calculus | Lecture (3 Credits)**

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

**General Education:** Mathematics

**MATH1810 | Calculus I | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MACH2140

**Corequisite(s):** IENG3220, PHYS1800, PHYS1810

**General Education:** Mathematics

**WRIT4020 | Capstone Technical Writing | Lecture (2 Credits)**

Research, plan, and organize professional documents for the capstone project. Topics include assessment techniques, special audience considerations, professional speaking skills, and presentation aids.

**General Education:** Upper Communications

**MATH1820 | Calculus II | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as calculating the area under curves or the capacities inside of complex geometries. Computer software will enable the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH2200

**Corequisite(s):** PHYS1820

**General Education:** Mathematics

**PHYS1810 | Calculus-Based Physics | Lecture (3 Credits)**

Introduction to mechanics using calculus, vectors and graphs to describe motion, and to analyze it in terms of forces and conservation laws. Applications include projectiles, orbits, oscillations and fluids.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Natural Sciences

## Mechanical Engineering (MENG), Bachelor of Science

The Mechanical Engineering bachelor's degree prepares students to enter the field of engineering ready to be a productive member of an engineering team from day one. Graduates can find employment in a variety of industries, including product design, research and development, heating ventilation and air conditioning (HVAC), consulting engineering, medical devices, and manufacturing.

Students learn how to apply engineering principles to mechanical design, and to the design of thermal and fluid systems. Students also learn to work collaboratively in a team environment and to use software tools current in the field. The curriculum is project-based so that theoretical engineering principles are reinforced and experienced through hands-on creation and problem-solving. Arts & Sciences courses help students understand the core mathematical and scientific principles which are the foundation of engineering theory, and provide students with the communication and critical thinking skills required to succeed in the profession.

All students complete a two-semester senior design project, working with advisors from local industry on real-world engineering projects. Graduates are prepared to pass the Fundamentals of Engineering Exam, the first step in becoming a licensed professional engineer (PE).

**Credential Earned:** BS

**Length of Program:** 4 years (8 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
CHEM2110	Chemistry with Lab	4
ENGL1010	English	3
MATH1811	Calculus I	4
MATH1821	Calculus II	4
MATH2260	Probability & Statistics	4
MATH2810	Multi-Variable Calculus	4
MATH2820	Linear Algebra & Differential Equations	4
PHYS1800	Physics I with Lab	4
PHYS1820	Physics II with Lab	4
WRIT2010	Technical Writing	3
Diversity		2
Humanities		2
Social Sciences		3
Upper Communications		2
Upper Humanities		2
<b>Technical Requirements</b>		
MENG1110	Engineering Drawings & 3D Design	4
MENG1120	Introduction to Engineering	3
MENG1210	Machining for Engineers Lab	2
MENG1220	Machining for Engineers	2
MENG1230	Statics	3
MENG2110	Introduction to Programming	3
MENG2210	Electrical & Controls Engineering Lab	2
MENG2220	Electrical & Controls Engineering	2
MENG2230	Dynamics	3
MENG2240	Mechanics of Materials	3
MENG3110	Dsgn for Manufacturability & CAD/CAM Lab	1
MENG3120	Design for Manufacturability & CAD/CAM	2
MENG3130	Introduction to Thermodynamics	4
MENG3140	Materials Science	3
MENG3210	GD&T & Measurements Lab	2
MENG3220	GD&T & Measurements	2
MENG3230	Fluid Mechanics	3
MENG3240	Failure Analysis & Design	2
MENG3250	Introduction to Heat Transfer	3
MENG4110	Transmission of Power Lab	2
MENG4120	Transmission of Power	2
MENG4130	Finite Element Analysis	3
MENG4140	Senior Design I	4
MENG4150	Principles of Quality & Lean Mfg	3
MENG4210	Heat Transfer Applications & HVACR Lab	2
MENG4220	Heat Transfer Applications & HVACR	2
MENG4230	Engineering Economics	2
MENG4240	Senior Design II	4
MENG4251	Engineering Ethics	2



MENG4260	Design of Experiments	2
Total Credits		126

## Sample Academic Plan

### Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
MENG1110	Engineering Drawings & 3D Design	4
MENG1120	Introduction to Engineering	3
MATH1811	Calculus I	4
PHYS1800	Physics I with Lab	4
Credits		15
Total Credits		15

Course	Title	Credits
<b>First Year</b>		
<b>Spring</b>		
MENG1210	Machining for Engineers Lab	2
MENG1220	Machining for Engineers	2
MATH1821	Calculus II	4
PHYS1820	Physics II with Lab	4
ENGL1010	English	3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Second Year</b>		
<b>Fall</b>		
MENG1230	Statics	3
MENG2110	Introduction to Programming	3
MATH2810	Multi-Variable Calculus	4
CHEM2110	Chemistry with Lab	4
Diversity		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>Second Year</b>		
<b>Spring</b>		
MENG2210	Electrical & Controls Engineering Lab	2
MENG2220	Electrical & Controls Engineering	2
MENG2230	Dynamics	3
MENG2240	Mechanics of Materials	3
MATH2820	Linear Algebra & Differential Equations	4
Humanities		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>Third Year</b>		
<b>Fall</b>		
MENG3110	Dsgn for Manufacturability & CAD/CAM Lab	1
MENG3120	Design for Manufacturability & CAD/CAM	2
MENG3130	Introduction to Thermodynamics	4
MENG3140	Materials Science	3
MATH2260	Probability & Statistics	4
Upper Communications		2
Credits		16
Total Credits		16

Course	Title	Credits
<b>Third Year</b>		
<b>Spring</b>		
MENG3210	GD&T & Measurements Lab	2
MENG3220	GD&T & Measurements	2
MENG3230	Fluid Mechanics	3
MENG3240	Failure Analysis & Design	2
MENG3250	Introduction to Heat Transfer	3
WRIT2010	Technical Writing	3
Credits		15
Total Credits		15

Course	Title	Credits
<b>Fourth Year</b>		
<b>Fall</b>		
MENG4110	Transmission of Power Lab	2
MENG4120	Transmission of Power	2
MENG4130	Finite Element Analysis	3
MENG4140	Senior Design I	4
MENG4150	Principles of Quality & Lean Mfg	3
Social Sciences		3
Credits		17
Total Credits		17

Course	Title	Credits
<b>Fourth Year</b>		
<b>Spring</b>		
MENG4210	Heat Transfer Applications & HVACR Lab	2
MENG4220	Heat Transfer Applications & HVACR	2
MENG4230	Engineering Economics	2
MENG4251	Engineering Ethics	2
MENG4260	Design of Experiments	2
Upper Humanities		2
Credits		12
Total Credits		12

## Courses

### Course Descriptions

#### MENG1110 | Engineering Drawings & 3D Design | Lecture (4 Credits)

Create 3D solid models and assemblies using SolidWorks. Interpret engineering prints; create detail and assembly drawings according to standards. Use freehand drawing as a graphical communication tool.

#### MENG1120 | Introduction to Engineering | Lecture (3 Credits)

Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

**MENG1210 | Machining for Engineers Lab | Laboratory (2 Credits)**

Employ metalworking techniques using typical shop equipment including mills, lathes, grinders, saws, and drills. Utilize hand tools to prep stock and finish edges.

**Prerequisite(s):** MDES2130

**Corequisite(s):** MENG1220

**MENG1220 | Machining for Engineers | Lecture (2 Credits)**

Use theory and understanding of machining operations to plan work to create parts efficiently.

**Prerequisite(s):** MDES2130

**Corequisite(s):** MENG1210

**MENG1230 | Statics | Lecture (3 Credits)**

Identification, recognition and calculations associated with forces acting on rigid bodies at rest. Use vector analysis to analyze concurrent forces, non-concurrent forces, friction forces, centroids and moments.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1821

**MENG2110 | Introduction to Programming | Lecture (3 Credits)**

Create programs to solve engineering problems. Apply modular design approaches, decision and loop structures, and object-oriented methods to write clear and efficient code for mechanical engineering applications.

**MENG2210 | Electrical & Controls Engineering Lab | Laboratory (2 Credits)**

Apply electrical and electronic controls to solve real-world problems. Topics include AC and DC motors, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**Prerequisite(s):** PHYS1820

**Corequisite(s):** MENG2220

**MENG2220 | Electrical & Controls Engineering | Lecture (2 Credits)**

Identification, recognition and calculations associated with electrical and electronic controls. Topics include AC and DC motors calculations, wiring diagrams, Ohm's Law, series and parallel circuits, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**Prerequisite(s):** PHYS1820

**Corequisite(s):** MENG2210

**MENG2230 | Dynamics | Lecture (3 Credits)**

Theory and calculations associated with kinematics and kinetics of particles, systems of particles and rigid bodies. Analyze the application of Newton's laws to the planar motion of rigid bodies.

**Prerequisite(s):** MENG1230

**MENG2240 | Mechanics of Materials | Lecture (3 Credits)**

Discover how materials behave under load including deformation under various loading profiles. Apply concepts to design of mechanical members such as beams, shafts, columns, and other load bearing devices.

**Prerequisite(s):** MENG1230

**MENG3110 | Dsgn for Manufacturability & CAD/CAM Lab | Laboratory (1 Credit)**

Use CAD/CAM software to create part geometries, tool paths, machining parameters and post processes NC code. Design and create parts using other common manufacturing processes, such as casting, injection molding, and sheet metal forming processes.

**Prerequisite(s):** MENG1210

**Corequisite(s):** MENG3120

**MENG3120 | Design for Manufacturability & CAD/CAM | Lecture (2 Credits)**

Introduction to common manufacturing processes, with emphasis on the principles of design for each process. Processes include: sheet metal forming, casting, welding, and plastic fabrication.

**Prerequisite(s):** MENG1220 And MENG1210

**Corequisite(s):** MENG3110

**MENG3130 | Introduction to Thermodynamics | Lecture (4 Credits)**

Theory and calculations associated with the principles of thermal energy as well applications of the first and second laws of thermodynamics. Topics include work and heat, control volume, steady states, uniform states, entropy, availability, power and refrigeration.

**Prerequisite(s):** MATH2820 And PHYS1800

**MENG3140 | Materials Science | Lecture (3 Credits)**

Identify different types of materials, their properties, and appropriate uses. Processes that change material properties include: alloy composition, heat treatment, coatings, and other modifications.

**Prerequisite(s):** MENG1220 And CHEM2110

**MENG3210 | GD&T & Measurements Lab | Laboratory (2 Credits)**

Use lab metrology equipment to assess the geometric dimensions and tolerances of parts, and to perform other mechanical measurements such as temperature, pressure, and flow.

**Prerequisite(s):** MENG3130

**Corequisite(s):** MENG3220

**MENG3220 | GD&T & Measurements | Lecture (2 Credits)**

Apply principles of physical measurements and error analysis to evaluate mechanical measurements. Create prints that include callouts for standards of accuracy using ASME/ANSI geometric dimensioning and tolerance standards.

**Prerequisite(s):** MDES1110 Or MENG1110

**Corequisite(s):** MENG3210

**MENG3230 | Fluid Mechanics | Lecture (3 Credits)**

Introduction to fluid statics and mechanics; laminar and turbulent flow with associated calculations. Applications to industry are used in problems.

**Prerequisite(s):** MATH2820

**MENG3240 | Failure Analysis & Design | Lecture (2 Credits)**

Examine advanced topics in modeling, design and best practices for machines, tooling and system assemblies. Evaluate components for protection against failure from low cycle fatigue, high cycle fatigue, ductile overload, corrosion.

**Prerequisite(s):** MENG2240

**MENG3250 | Introduction to Heat Transfer | Lecture (3 Credits)**

Examine the fundamentals of heat transfer modes including conduction, convection, and radiation. Calculations for each mode are included.

**Prerequisite(s):** MATH2820 And MENG3130

**MENG4110 | Transmission of Power Lab | Laboratory (2 Credits)**

Assemble and test mechanical power transmission systems, including gearboxes and fluid power systems. Correctly size components and evaluate power losses, service life, and safety factors.

**Prerequisite(s):** MATH2820 And MENG3130

**Corequisite(s):** MENG4120

**MENG4120 | Transmission of Power | Lecture (2 Credits)**

Apply principles of mechanical design and material failure to the design and analysis of mechanical power transmission components, such as gears, linkages, shafts, bearings and cams.

**Prerequisite(s):** MATH2820 And MENG3240

**Corequisite(s):** MENG4110

**MENG4130 | Finite Element Analysis | Lecture (3 Credits)**

Finite element modeling using both manual and software simulation analysis. Topics include two- and three-dimensional elements along with applications in solid mechanics, heat transfer and fluid mechanics.

**Prerequisite(s):** MATH2820

**MENG4140 | Senior Design I | Capstone (4 Credits)**

Student design teams execute a two semester design project to solve a real world problem. Application of the design process, underlying science, and application of concepts and tools gained in the curriculum are necessary. Application of project management principles and tools.

**MENG4150 | Principles of Quality & Lean Mfg | Lecture (3 Credits)**

Investigate several quality conventions used to reduce waste, improve quality, decrease production times, and improve customer satisfaction. Topics include statistics, queuing models, control charts for variables, acceptance criteria, and acceptance sampling.

**Prerequisite(s):** MATH2260

**MENG4210 | Heat Transfer Applications & HVACR Lab | Laboratory (2 Credits)**

Hands-on testing of heat transfer devices including heat, ventilation, and air conditioning systems.

**Prerequisite(s):** MENG3250

**Corequisite(s):** MENG4220

**MENG4220 | Heat Transfer Applications & HVACR | Lecture (2 Credits)**

Apply heat transfer theory to common industrial devices. HVACR and other applications are analyzed.

**Prerequisite(s):** MENG3250

**Corequisite(s):** MENG4210

**MENG4230 | Engineering Economics | Lecture (2 Credits)**

Combines the concepts of finance and economics with the engineering environment. Analyze costs, risk, funding options, economic return on investment, legal and environmental concerns.

**MENG4240 | Senior Design II | Capstone (4 Credits)**

Continuation of Senior Design I projects. Final deliverables are submitted, project is presented and closed out. Presentations are open to students, faculty, and the public in a symposium format.

**Prerequisite(s):** MENG4140

**MENG4251 | Engineering Ethics | Lecture (2 Credits)**

Interpret the connection between personal morality, the role of engineers and engineering in society, and relationship to one's employer. Case studies involving conflicts within these roles are reviewed and evaluated.

**MENG4260 | Design of Experiments | Lecture (2 Credits)**

Introduction to industrial experimentation through the use of statistical software to perform mathematical regression and analysis of variance for system functionality. Topics include randomized designs, blocking designs, full factorial designs and fractional factorial designs.

**Prerequisite(s):** MATH2260

**MATH1811 | Calculus I | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Utilize multiple methods in the calculation and application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MATH2140

**Corequisite(s):** PHYS1800 PHYS1810

**General Education:** Mathematics

**PHYS1800 | Physics I with Lab | Lec/Lab (4 Credits)**

Introduction to mechanics using differential calculus as a foundation. Topics include kinematics and dynamics of linear motion, static equilibrium, the conservation of energy and momentum, mechanics of solids and fluids, and thermodynamics. The laboratory portion incorporates experimentation, instrumentation, and graphical tools to verify calculations in motion, mechanics and thermodynamics.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Physical Sciences with Lab

**MATH1821 | Calculus II | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements such as the area under curves, the volumes within complex geometries, and for describing functions as an infinite series. Computer software enables the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MENG1230 PHYS1820

**General Education:** Mathematics

**PHYS1820 | Physics II with Lab | Lec/Lab (4 Credits)**

An introductory calculus-based course in electromagnetic fields and their applications. Topics include: Coulomb's and Gauss' Law, electric fields and potentials, electrical and magnetic properties of matter, Ampere's and Faraday's laws, elementary DC and AC circuits, Maxwell's equations, and electromagnetic waves.

**Prerequisite(s):** MATH1821, Or MATH1820, And PHYS1800

**Corequisite(s):** MATH1820 MATH1821

**General Education:** Physical Sciences with Lab

**ENGL1010 | English | Lecture (3 Credits)**

Analyze the research and essay-writing process for purpose, planning, drafting, and revision. Explore writing patterns and thought development. Incorporate concepts of grammar and usage, documentation, source relevancy and credibility. Focus is on clear, concrete writing.

**General Education:** Communications

**MATH2810 | Multi-Variable Calculus | Lecture (4 Credits)**

Differentiate and integrate functions of two and three variables. Apply differentiation and integration techniques to physical sciences and engineering. Explore the theorems of Green and Stokes.

**Prerequisite(s):** MATH1820

**General Education:** Mathematics

**CHEM2110 | Chemistry with Lab | Lec/Lab (4 Credits)**

Develop a basic understanding of the central principles of chemistry that are useful to explain and predict the properties of chemical substances based on their atomic and molecular structure; promotes the development of basic and advanced science process skills.

**General Education:** Physical Sciences with Lab

**MATH2820 | Linear Algebra & Differential Equations | Lecture (4 Credits)**

Introduction to Linear Algebra, including vector spaces and linear mappings between such spaces. Explore solution methods for ordinary differential equations, qualitative techniques; includes matrix methods approach to systems of linear equations and series solutions.

**Prerequisite(s):** MATH1810 And MATH1820

**General Education:** Mathematics

**MATH2260 | Probability & Statistics | Lecture (4 Credits)**

Introduction to probability and statistics with applications. Topics include: basic combinatorics, random variables, probability distributions, hypothesis testing, confidence intervals, and linear regression.

**Prerequisite(s):** MATH1820 Or MATH1821

**General Education:** Mathematics

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

## Software Engineering (SENG), Bachelor of Science

The Software Engineering bachelor's degree prepares students to enter the field of Information Technology as software engineers. Graduates can find employment in a variety of IT fields working for almost all industries, including medical, financial, manufacturing, consumer, military, and energy. Students learn how to apply engineering principles in the successful development, testing, management, implementation, and evolution of software products. Coursework builds knowledge in software product development and life cycles; web applications and services; distributed and cloud computing; database applications; and cross-device application development.

Students learn to work collaboratively in a team environment and to use quality tools and data to anticipate and solve issues in the engineering process. Curriculum is project-based so that theoretical engineering principles are reinforced and experienced through hands-on creation and problem-solving.

Arts & Sciences courses help students understand the core mathematical and scientific principles that all engineering projects grow out of as well as providing students with the communication and critical thinking skills required to succeed in the profession. The degree culminates in a senior project, which provides students the opportunity to round out their professional portfolio.

**Credential Earned:** BS

**Length of Program:** 4 years (8 semesters)

**Classes Offered:** Day

**Available Starts:** Fall Semester

## Program Outcomes

### Program Outcomes:

- An ability to apply knowledge of math, science, and software engineering as well as collect, analyze and interpret data.
- The ability to analyze, design and manage the development of a computing-based system, component or process to meet desired needs within realistic constraints in one or more application domains.
- An ability to function on multidisciplinary teams.
- An ability to identify, formulate, and solve software engineering problems using a well-defined engineering process.
- Demonstrate understanding of professional and ethical responsibility.
- Display a commitment to on-going professional competence and possession of basic professional and organizational success skills.

- Engage in lifelong learning.
- The ability to communicate effectively with colleagues, customers and executives.
- Demonstrate an understanding of the role and impact software engineering plays in business, global, economic, environmental and societal contexts.
- Apply appropriate tools such as discrete mathematics, probability and statistics, and other relevant tools in computer science and supporting disciplines to complex software systems.
- Display the ability to think critically, clearly identifying and using evidence, criteria, and values in decision making process.

## Degree Requirements

### Degree Requirements

Code	Title	Credits
<b>General Requirements</b>		
HUMN4000	Ethical Decision-Making	2
MATH1250	Boolean Algebra	3
MATH1811	Calculus I	4
MATH1821	Calculus II	4
MATH2250	Statistics	3
PHYS1800	Physics I with Lab	4
WRIT2010	Technical Writing	3
Communications		3
Humanities		3
Mathematics/Natural Sciences		10
Social Sciences		4
<b>Technical Requirements</b>		
CWEB1110	Programming Fundamentals	4
MENG1120	Introduction to Engineering	3
CWEB2010	Advanced Programming	4
CNTS1121	Network Fundamentals	3
SENG2200	Introduction to Software Engineering	3
SENG2100	Introduction to Computing	3
BCSA3110	Discrete Mathematics	3
SENG2210	Software Design	4
SENG3110	Software Testing	3
SENG3120	Software Process Improvement	3
SENG3300	Data Introduction	3
SENG3210	Software Architecture	3
SENG3220	Software Project Management	3
SENG3230	Human-Computer Interaction	3
SENG4110	Software Engineering Senior Project I	3
SENG4310	Security I	3
MENG4230	Engineering Economics	2
SENG3310	Database Systems	4
SENG4210	Software Engineering Senior Project II	3
SENG4320	Security II	3
<b>Technical Elective</b>		
Choose any upper division technical courses		15
Total Credits		121

## Sample Academic Plan

The following sample academic plan demonstrates how a student's schedule might look on a semester-by-semester basis, including elective courses. Your actual degree plan may differ from this sequence, depending on whether you start in the fall or spring semester, what transfer credits you may have (if any), and which Arts & Sciences courses and electives you take and when you take them.

The sample academic plan is for informational purposes only. To determine your academic plan, please meet with an academic advisor.

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CWEB1110	Programming Fundamentals	4
MENG1120	Introduction to Engineering	3
MATH1250	Boolean Algebra	3
Mathematics/Natural Sciences		6
	Credits	16
	Total Credits	16
<b>Spring</b>		
CWEB2010	Advanced Programming	4
CNTS1121	Network Fundamentals	3
WRIT2010	Technical Writing	3
Communications		3
Mathematics/Natural Sciences		4
	Credits	17
	Total Credits	17
<b>Second Year</b>		
<b>Fall</b>		
SENG2200	Introduction to Software Engineering	3
SENG2100	Introduction to Computing	3
MATH1811	Calculus I	4
PHYS1800	Physics I with Lab	4
	Credits	14
	Total Credits	14
<b>Spring</b>		
BCSA3100	Computer Architecture	3
SENG2210	Software Design	4
MATH1821	Calculus II	4
Any upper technical courses		3
Social Sciences		2
	Credits	16
	Total Credits	16
<b>Third Year</b>		
<b>Fall</b>		
SENG3110	Software Testing	3
SENG3120	Software Process Improvement	3
Any upper technical courses		6

MATH2250	Statistics	3
	Credits	15
	Total Credits	15
<b>Fourth Year</b>		
<b>Fall</b>		
SENG3300	Data Introduction	3
SENG3210	Software Architecture	3
SENG3220	Software Project Management	3
SENG3230	Human-Computer Interaction	3
Any upper technical courses		3
	Credits	15
	Total Credits	15
<b>Spring</b>		
SENG4110	Software Engineering Senior Project I	3
SENG4310	Security I	3
MENG4230	Engineering Economics	2
SENG3310	Database Systems	4
Humanities		3
	Credits	15
	Total Credits	15
<b>Fourth Year</b>		
<b>Spring</b>		
SENG4210	Software Engineering Senior Project II	3
SENG4320	Security II	3
Any upper technical courses		3
HUMN4000	Ethical Decision-Making	2
Social Sciences		2
	Credits	13
	Total Credits	13

## Courses

### CWEB1110 | Programming Fundamentals | Lec/Studio (4 Credits)

Basic programming principles like data types, variables, expressions, operators, Boolean logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data-structures, object-oriented and event driven programming.

### MENG1120 | Introduction to Engineering | Lecture (3 Credits)

Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

### CWEB2010 | Advanced Programming | Lec/Studio (4 Credits)

Create windows based applications. High level, event driven programming language concepts with an emphasis on user interface. Advanced object-oriented languages.

**Prerequisite(s):** CWEB1110

### CNTS1121 | Network Fundamentals | Lec/Lab (3 Credits)

Concept and terminology introductions, data communications in a business environment. Client-server networking; communication hardware, software, and basic security is introduced. Services and models supporting data communications interoperability introduced. Configure and troubleshoot basic network connections and the hardware/software associated.



**SENG2200 | Introduction to Software Engineering | Lec/Lab (3 Credits)**

Introduction to software engineering as an area of computer science. Focused study of requirements; overview of various modeling techniques applicable to requirements and specifications, including UML and formal modeling.

**SENG2100 | Introduction to Computing | Lec/Lab (3 Credits)**

Introduction to computer science, software engineering, and the intersection of these fields with each other, other engineering disciplines, and the sciences in general. Historical perspectives on the fields. Ethics, team building, professional communication, and problem solving.

**BCSA3110 | Discrete Mathematics | Lecture (3 Credits)**

Examine the logic-related mathematical background necessary for upcoming courses. Topics include: logic, sets, functions (as defined in the Mathematics domain), sequences, algorithmic complexity, number theory, matrices, proof of complexity, mathematical induction, recursion, counting, probability, and graph and tree fundamentals.

**SENG2210 | Software Design | Lec/Lab (4 Credits)**

Designing software with long-term software quality. Software quality attributes, domain-driven design, software design patterns, and documentation.

**SENG3110 | Software Testing | Lec/Lab (3 Credits)**

Investigate testing methodologies. Tools and techniques in automated testing. Creation of documentation at all stages of testing.

**SENG3120 | Software Process Improvement | Lec/Lab (3 Credits)**

Assessment and improvement of the software development process. Techniques and tools related to each software development life cycle model and stage. Issues include those related to development and maintenance, quality, safety, security assurance, and project management. Quality assurance processes and techniques, ISO9000 and Software Engineering Institute Capability Maturity Model integration.

**SENG3300 | Data Introduction | Lec/Lab (3 Credits)**

Accelerated beginning course in data usage and management including language syntax, document model, document types, schemas and stylesheets from EXtensible Markup Language (XML) with a focus on creating structured content and data for business application.? Integration of relational database concepts and design of database management systems for enterprise information needs.? Data modeling with Unified Modeling Language (UML) and Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

**SENG3210 | Software Architecture | Lec/Lab (3 Credits)**

Architecture of large-scale software systems. Architectural patterns, software quality, documentation of scenarios. Presentation to management for project funding and go-no go decision making. Reusable component design and development. Explanation to design and development personnel.

**SENG3220 | Software Project Management | Lec/Lab (3 Credits)**

Planning, organization, estimation, risk management. Traditional and emerging software development life cycle models. Tools and techniques for management software projects.

**SENG3230 | Human-Computer Interaction | Lec/Lab (3 Credits)**

Design and evaluate interactive application interfaces, user- and task-centered approaches to design, guidelines for graphical design, interface evaluation techniques, current interface trends, including web interfaces and information visualization. Group projects that include designing, prototyping, and implementing an application interface.

**SENG4110 | Software Engineering Senior Project I | Lec/Lab (3 Credits)**

End-to-end project exhibiting all skills related to the profession. Focus is on requirements elicitation, scheduling, planning, reviews and postmortem, configuration management, and implementation of the project.

**SENG4310 | Security I | Practicum (3 Credits)**

Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

**MENG4230 | Engineering Economics | Lecture (2 Credits)**

Combines the concepts of finance and economics with the engineering environment. Analyze costs, risk, funding options, economic return on investment, legal and environmental concerns.

**SENG3310 | Database Systems | Lec/Lab (4 Credits)**

Accelerated course in data management. Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas, normalization, data warehouses, data mining, data cubes. Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, and security.

**Prerequisite(s):** SENG3300

**SENG4210 | Software Engineering Senior Project II | Lec/Lab (3 Credits)**

End-to-end project exhibiting all skills related to the profession. Focus is on requirements elicitation, scheduling, planning, reviews and postmortem, configuration management, and implementation of the project.

**Prerequisite(s):** SENG4110

**SENG4320 | Security II | Lec/Lab (3 Credits)**

Explore fundamental and emerging concepts of computer security.? Topics include: maintaining information confidentiality, protecting information integrity, assuring information availability, physical, technical, application, and Internet security, social engineering and associated attacks.

**MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

**MATH1811 | Calculus I | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Utilize multiple methods in the calculation and application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MACH2140

**Corequisite(s):** PHYS1800 PHYS1810

**General Education:** Mathematics

**PHYS1800 | Physics I with Lab | Lec/Lab (4 Credits)**

Introduction to mechanics using differential calculus as a foundation.

Topics include kinematics and dynamics of linear motion, static equilibrium, the conservation of energy and momentum, mechanics of solids and fluids, and thermodynamics. The laboratory portion incorporates experimentation, instrumentation, and graphical tools to verify calculations in motion, mechanics and thermodynamics.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Physical Sciences with Lab

**MATH1821 | Calculus II | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements such as the area under curves, the volumes within complex geometries, and for describing functions as an infinite series. Computer software enables the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MENG1230 PHYS1820

**General Education:** Mathematics

**MATH2250 | Statistics | Lecture (3 Credits)**

Descriptive and inferential statistics, frequency distributions, probability theory, and issues related to gathering data; computer spreadsheets facilitate the organization, analysis and display of data.

**General Education:** Mathematics

**HUMN4000 | Ethical Decision-Making | Lecture (2 Credits)**

Examine major moral theories of right and wrong, such as utilitarianism, deontology, egoism, virtue ethics, and feminism. Apply these theories in sound, ethical decision-making particularly in one's professional life. Through case studies, the consequences of a decision in terms of responsibilities to the company and the economy, to the people impacted by the decision, and to the environment at large are weighed. Explore the tension often created by the difference between what is morally right and what the company's code of ethics states or what the society's laws require.

**General Education:** Upper Humanities

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## Applied Management & Leadership (AMGT)

### AMGT3211 | Project Management Practicum | Practicum (2 Credits)

Apply project management methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT3211

### AMGT3230 | Strategic Planning Practicum | Practicum (2 Credits)

Apply strategic planning management methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT3230

**AMGT4110 | Human Resources Practicum | Practicum (3 Credits)**

Carry out an in-depth investigation of a variety of Human Resources topics. The course will be project based; each student will identify an HR project relevant to his/her chosen field of study.

**Prerequisite(s):** MGMT3220

**AMGT4112 | Leadership Practicum | Practicum (2 Credits)**

Application of leadership theory and methodology through the use of a case study and project for the purpose of integrating information and skills learned in previous program courses.

**Prerequisite(s):** MGMT4110

**AMGT4120 | Leading Organizational Change Practicum | Practicum (2 Credits)**

Apply organizational change theory and methodology through the management of a project on an assigned case study for the purpose of integrating information and skills learned in previous courses.

**Prerequisite(s):** MGMT4120

**AMGT4220 | Negotiation & Conflict Resolution Prac | Practicum (2 Credits)**

Apply negotiation and conflict resolution methodology through the use of hands on case studies and projects. Strategies and tactics for conflict analysis, assessment and negotiation created and monitored by students.

**Prerequisite(s):** MGMT4220

## Applied Management with MIS Concentrn (MISB)

**MISB3211 | Systems Analysis Practicum | Practicum (2 Credits)**

Survey of the various approaches for software development from traditional systems analysis to contemporary agile methods, UML and object-oriented design. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

**MISB3221 | Database Technologies | Practicum (2 Credits)**

Database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

**MISB4111 | Management of Distributed Systems | Practicum (2 Credits)**

Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

**MISB4211 | Management Information Systems II | Practicum (2 Credits)**

Examine budgeting, how to write RFP's (Request for Proposal), contract management, capacity planning, operations and user support, orphan ware, writing and enforcing policies. Identify aspects of security in software programs, social engineering, and network security.

## Architectural Drafting & Design (ARCH)

**ARCH1102 | Studio 1 - Drawing Mechanics | Studio (5 Credits)**

Introduction to the evolution of architectural drawing, from hand drafting to building information modeling, in this first foundational design studio. Redraw a full set of construction documents using hand and digital techniques to develop a proficiency in the mechanics of architectural drawing.

**ARCH1104 | Building Systems | Lecture (3 Credits)**

Examine primary building systems and their associative materials and assemblies. With a focus on current building systems, analyze existing buildings through photography, physical tours, and diagrammatic drawing to achieve a broad knowledge of primary structural systems.

**ARCH1201 | Construction Documents | Seminar (1 Credit)**

Exposure to varying theories, organizational principles, and legal implications of construction drawings and specifications. Research and analyze examples of technical documentation to achieve a basic knowledge of the practical and legal organization of building information.

**ARCH1202 | Studio 2 - Documentation | Studio (5 Credits)**

Engage in the generation of construction drawings in this second foundational design studio. Draw, coordinate and publish a full set of construction drawings from a given set of resolved design development drawings and outline specifications to develop a proficiency in construction documents.

**Prerequisite(s):** ARCH1102

**ARCH1203 | Building Codes & Regulations | Lecture (3 Credits)**

Introduction to the current acts and codes which guide the building design process. Analyze an existing building and perform a detailed code analysis and review to develop a proficiency in reading, using, and applying building codes and regulations.

**ARCH1204 | Structure & Envelope | Lecture (3 Credits)**

Introduction to aspects of building assemblies relative to their energy performance, moisture control, durability, and resource efficiency. Research multiple existing buildings through various means to achieve a broad knowledge of varying strategies for the building structure and envelope.

**ARCH2101 | Seminar 3 - Visualization | Seminar (1 Credit)**

Introduction to the basic principles of representation including physical and digital sketching, physical and digital modeling, and architectural visualization. Develop 2D and 3D representations of a given architectural space to develop a proficiency in using several design technologies for architectural representation.

**ARCH2102 | Studio 3 - Design Development | Studio (5 Credits)**

Engage in the design development process, in this third foundational studio, with an emphasis on accessibility and health safety. Design and develop details, specifications, and construction documents from a given resolved schematic design to develop a proficiency in design development.

**Prerequisite(s):** ARCH1202

**ARCH2103 | Project Management | Lecture (3 Credits)**

Introduction to the legal and work flow issues within the context of varying project delivery methods. Research the work flow, organization of information, and decision making structures of specific projects currently in progress at local firms to develop a broad knowledge of project management.

**ARCH2104 | Building Service Systems | Lecture (3 Credits)**

Introduction to the principles of embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, day lighting, artificial lighting and acoustics. Research multiple existing buildings through various means to achieve a broad knowledge of varying environmental systems.

**ARCH2105 | Economics of Practice | Seminar (1 Credit)**

Introduction to the financial considerations surrounding the practice of architecture and related construction fields. Analyze the value of design by monetary measure based on varying delivery methods, design processes, and practice models.

**ARCH2201 | Portfolio | Seminar (1 Credit)**

Focus is on the communication and organization of a professional portfolio, resume and application for employment or advancement in higher learning. Develop a personal portfolio to develop a proficiency in documenting and presenting previously completed works.

**ARCH2202 | Studio 4 | Studio (5 Credits)**

Engage in the interpretation of design intent, in this final foundational studio, with a focus on sustainability. Resolve and develop into construction documents an early schematic design to achieve a proficiency in the architectural process from resolved schematic design to construction documents.

**Prerequisite(s):** ARCH2102

**ARCH2203 | Material Strengths | Lecture (3 Credits)**

Introduction to the fundamentals of material behavior. Examine the physical changes a body undergoes when acted upon by forces. Investigate stress and strain relations, shear forces, bending moments, and beam deflections.

**Prerequisite(s):** MATH1050

**ARCH2204 | Building Envelope & Environment | Lecture (3 Credits)**

Introduction to the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, conveying systems, security, and fire protection systems. Research multiple existing buildings through various means to achieve a broad knowledge of varying building service systems.

**ARCH2205 | Economics of Building | Lecture (3 Credits)**

Introduction to a broad range of standard building conditions and their economic impact. Engage in a full economic analysis of select buildings and develop diagrams, preliminary cost estimates, and life cycle cost analysis to achieve a broad knowledge of building economics.

**ARCH3101 | Architecture Seminar A | Seminar (1 Credit)**

Introduction to established and emerging ways of thinking about architectural space and form. Explore physical and digital modes of representation to develop skills that utilize design thinking, ordering systems, and investigative skills.

**ARCH3102 | Studio 5 - Site & Precedent | Studio (5 Credits)**

This first design studio introduces students to design thinking and fundamental design skills with an emphasis on site and precedent. Students will be given a site and program to develop cultural, typological, theoretical, and historical frameworks upon which to conceive an architectural work.

**ARCH3103 | Architectural Theory | Lecture (3 Credits)**

This survey course introduces students to a multitude of architectural ideas across human history. Critical writings, conceptual design works, and current lectures will be studied and synthesized so students may begin to find a personal theoretical framework.

**ARCH3201 | Architecture Seminar B | Seminar (1 Credit)**

Explore physical and digital modes of representation to develop ordering skills utilizing design thinking, ordering systems, and investigative skills.

**ARCH3202 | Studio 6 - Program & Client | Studio (5 Credits)**

This studio engages students in pre-design processes including the assessment of client and user needs, analysis of site, and building on acquired design principles, students will be given a site and a user to develop a comprehensive program to conceive of and develop an architectural work.

**ARCH3203 | History of Architecture I | Lecture (3 Credits)**

This survey course introduces students to the world of architecture throughout the history of human settlement up to the modern era. Particular attention is given to the histories of design technologies and building science as well as the evolution of the role of the architect in human civilization.

**ARCH4101 | Architecture Seminar C | Seminar (1 Credit)**

Physical and digital modes of representation used to develop presentation skills utilizing design thinking, ordering systems, and investigative skills.

**ARCH4102 | Studio 7 - Interdisciplinary | Studio (5 Credits)**

This studio requires students to produce an architectural work as part of an interdisciplinary team. Students will be given a complex program and context. Students will achieve the capacity to collaborate across disciplines, synthesize their knowledge of previous studios, and make design decisions across multiple design factors.

**ARCH4103 | Structures | Lecture (3 Credits)**

This applied research course focuses on the advanced study of statics and strengths of materials. Students will perform comparative analysis of structural systems using emerging or alternative materials against industry standards. Analysis will involve mathematical documentation of hands on testing. Students will develop a proficiency in architectural structures as well as a basic knowledge of architectural research.

**ARCH4104 | History of Architecture II | Lecture (3 Credits)**

This lecture and research course introduces students to architecture of the modern movement up to present day. Critical writings, conceptual design works, current lectures, and building tours will be studied and synthesized so students may gain an individual position on the present and future condition of architectural history.

**ARCH4201 | Architecture Seminar | Lecture (2 Credits)**

This course examines special topics related to the field of Architecture. Topics rotate each year.

**ARCH4202 | Studio 8 - Abroad/Design Build | Studio (6 Credits)**

8A. This studio places students within an architecture program at a partner international institution. Students will be integrated into the established studio curriculum to acquire a proficiency in international design in an immersive learning environment. 8B. This studio places students within the local community, pairing the curriculum with a local non-profit organization within one of the Twin Cities many ethnically diverse communities. Students will engage the community in a participatory design process to conceive of and construct a small scale community structure. Students will achieve a detailed knowledge of public interest design and multi-cultural design in a hands-on learning environment.

**ARCH4203 | Culture | Lecture (4 Credits)**

Examine the relationship between architecture, representation and humanity. Immersion in an international architectural community to acquire a detailed knowledge of varying cultures and human behaviors and how they represent and manifest themselves architecturally.

**ARCH4204 | Studio 8 - Abroad/Design Build | Studio (7 Credits)**

In an immersive learning environment, develop a proficiency in design in varying cultural contexts. Acquire a detailed knowledge of varying cultures and human behaviors and how they represent and manifest themselves architecturally.

**ARCH4205 | Architecture Seminar D | Seminar (1 Credit)**

Physical and digital modes of representation used to explore skills utilizing design thinking, ordering systems, and investigative skills.



**ARCH5101 | Architecture Seminar E | Seminar (1 Credit)**

Physical and digital modes of representation used to understand design process utilizing design thinking, ordering systems, and investigative skills.

**ARCH5102 | Studio 9 - Comprehensive I | Studio (6 Credits)**

The first part of a yearlong studio is a culmination of the core curriculum. Design skills will be demonstrated through an architectural work which integrates critical and abstract thinking, with building systems knowledge, life safety considerations, financial, cultural and environmental balance, and construction documentation skills. Students will acquire a proficiency in integrated systems thinking and comprehensive design.

**ARCH5103 | Professional Practice | Lecture (3 Credits)**

This business course introduces students to successful models for owning, operating, and managing an architectural practice. Focus is given to business and marketing planning, as well as leadership in business management. Students will research varying established models and develop business and marketing plans to achieve a detailed knowledge of professional practice.

**ARCH5104 | Studio 9 - Comprehensive I | Studio (7 Credits)**

Demonstrate design skills through an architectural work which integrates critical and abstract thinking, with building systems knowledge, life safety considerations, financial, cultural and environmental balance, and construction documentation skills. Acquire a proficiency in integrated systems thinking and comprehensive design.

**ARCH5201 | Architecture Seminar F | Seminar (1 Credit)**

Prepare for the Architectural Registration Exam through review and study of material most likely to be covered on all of the most current exams.

**ARCH5202 | Studio 10 - Comprehensive II | Studio (8 Credits)**

The second part of a yearlong studio is a culmination of the core curriculum. Design skills will be demonstrated through an architectural work which integrates critical and abstract thinking, with building systems knowledge, life safety considerations, financial, cultural and environmental balance, and construction documentation skills. Students will acquire a proficiency in integrated systems thinking and comprehensive design.

**ARCH5203 | Applied Research | Lecture (3 Credits)**

This applied research course seeks to advance the art and discipline of architecture through the development of new design and building technologies. Students will propose, test and develop undocumented or as yet not discovered design tools, building assemblies, fabrication methods, or materials. Students will develop a proficiency in an architectural research process.

## Arts (ARTS)

**ARTS1000 | Introduction to Drawing | Lecture (3 Credits)**

Analyze basic drawing concepts and techniques through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Work from observation using line, tone and other elements of art to solve spatial, compositional and light problems to accurately render the illusion of 3-dimensional form on a 2-dimensional surface.

**General Education:** Humanities

**ARTS1250 | History of Design | Lecture (3 Credits)**

A survey of major movements and tendencies, and key figures in the development of graphic, craft, and industrial design between the mid-nineteenth century and the present day.

**General Education:** Humanities

**ARTS1350 | Structural Drawing | Lecture (3 Credits)**

Basic drawing concepts and techniques are studied through demonstrations, discussions, critiques, slide lectures, and the use of a sketchbook. Working from observation and using line, tone and the rules of linear perspective to solve spatial, compositional and color/light problems and form a 3-dimensional illusion of space as it relates to human constructs.

**General Education:** Humanities

## Auto Collision Repair & Refinishing (ABDY)

**ABDY1111 | Introduction to Auto Body | Lec/Lab (1 Credit)**

Overview of the past, present, and future of the collision industry with emphasis on safety, equipment, tools, and body shop operations. Industry expectations and career opportunities are explored.

**ABDY1120 | Panel Replacement I: Bolt on Panels | Lec/Lab (2 Credits)**

Identify, remove, and install all vehicle panels requiring bolt on application. Practice alignment techniques, acceptable fasteners, and industry approved methods.

**Prerequisite(s):** ABDY1111

**ABDY1130 | Panel Straightening & Paint Prep | Lec/Lab (3 Credits)**

Examine and practice industry acceptable methods of metal straightening, plastic filler application, primer surfacers, and sanding techniques. Prepare OEM finishes for refinishing on metal and plastic panels.

**Prerequisite(s):** ABDY1120

**ABDY1140 | Auto Body Welding | Lec/Lab (3 Credits)**

Relate safety, equipment, and welding techniques to collision repair. Special consideration to I-CAR welding procedures and tests.

**Prerequisite(s):** ABDY1130

**ABDY1150 | Plastic Repairs | Lec/Lab (1 Credit)**

Identify and practice techniques associated with welding, bonding, and cosmetic repair of automotive plastics. Prepare interior plastic for refinishing and re-texturing.

**Prerequisite(s):** ABDY1140

**ABDY1210 | Brake & Suspension Repairs | Lec/Lab (2 Credits)**

Examine automotive brakes and suspensions, ABS and traction control systems, alignments, and steering for collision related damage.

**Prerequisite(s):** ABDY1120

**ABDY1220 | Intro to Refinishing Metals & Plastics | Lec/Lab (3 Credits)**

Identify refinishing safety issues, environmental concerns, water-based paint and solvent based paint procedures; practice correct procedures on metals and plastics as related to collision repair.

**Prerequisite(s):** ABDY1150

**ABDY1230 | Automotive Refinishing & Detailing | Lec/Lab (5 Credits)**

Practice refinishing of automotive collision repairs, and vehicle masking techniques; identify paint problems and corrections.

**Prerequisite(s):** ABDY1220

**ABDY1311 | Damage Analysis & Estimating | Lec/Lab (1 Credit)**

Practice in collision damage appraisal using industry accepted software and computerized estimating programs to prepare collision damage reports or estimates.

**Prerequisite(s):** ABDY1230

**ABDY1320 | Summer Production Repair Lab I | Laboratory (4 Credits)**

Practice the skills learned in the first year of coursework using customer vehicles.

**Prerequisite(s):** ABDY1311

**ABDY2110 | Aluminum Welding & Complex Panel Repair | Lec/Lab (3 Credits)**

Properties of aluminum, aluminum alloys, welding processes and materials utilized for aluminum welding. Setup and adjustment of the MIG welder for aluminum, weld joint preparation, aluminum welding procedures and safety precautions. Welding on aluminum adhering to I-CAR Aluminum welding standards and testing methods. Body panel damage assessment. Repair of steel and aluminum body panels with complex shapes and damage to style lines and attached inner panels. Procedures and products used to restore corrosion protection to repaired panels.

**Prerequisite(s):** ABDY1130 And ABDY1140

**ABDY2120 | Electrical, A/C Repairs & Hybrid Safety | Lec/Lab (3 Credits)**

Fundamentals of electricity and related automotive circuits, tracing of vehicle wiring diagrams and repair of collision related malfunctions of electrical components and wiring. Identification and usage of electrical test tools and head lamp aiming. Air conditioning theory of operation, properties of refrigerants, and safety procedures. Set up and use of air conditioning service equipment. Refrigerant reclaiming, recycling, evacuation and recharging. Diagnostic procedures for troubleshooting air conditioning systems. Safety precautions and disabling procedures for working on and around hybrid vehicle electrical systems.

**Prerequisite(s):** ABDY1320

**ABDY2130 | Restraint Systems & Stationary Glass | Lec/Lab (3 Credits)**

The development of restraint systems. Air bag theory of operation, function of components and wiring, deployment conditions, safety precautions, and inspection procedures for restraint systems. Practice of service procedures for air bag and seat belt systems. The role that glass plays in a modern vehicle. Procedures for replacement of structural glass and for correction of wind noises and water leaks. Removal and re-installation of interior trim.

**Prerequisite(s):** ABDY2120

**ABDY2140 | Finish Matching & Plastic Refinishing | Lec/Lab (2 Credits)**

Collision industry procedures used for color matching, tinting and blending. Color theory, panel preparation and practical application of urethane (solvent based) and waterborne automotive paint products utilizing color mixing systems. Procedures, techniques, and materials used in tri-coat (three stage) finish repairs. Specialized products and procedures used to refinish automotive plastics. Identification and refinishing of flexible plastic panels.

**Prerequisite(s):** ABDY1230

**ABDY2210 | Panel Replacement II: Welded Panels | Lec/Lab (2 Credits)**

Identification, removal and installation of welded and adhesively bonded automotive body panels. Identification and use of a squeeze type resistance spot welder and other specialized panel removal tools and welding equipment. Practice restoring corrosion protection to replaced panels using primers and anti-corrosion compounds. Identification of and proper application of automotive body seam sealers.

**Prerequisite(s):** ABDY1120 And ABDY2110

**ABDY2222 | Structural Analysis, Measuring & Repair | Lec/Lab (6 Credits)**

Vehicle collision damage analysis, inspection techniques, damage classification and types of vehicle construction. Measuring concepts, set-up and use of measuring systems, vehicle anchoring systems and structural straightening equipment. Industry (I-CAR) guidelines for structural repairs including frame and unibody straightening, structural component replacement, sectioning and restoring corrosion protection. Disassemble vehicles for repairs, develop a vehicle repair plan, perform structural repairs, including repairs to mechanical and electrical systems as well as replacement of structural glass.

**Prerequisite(s):** ABDY2210

**ABDY2231 | Custom Painting | Lec/Lab (1 Credit)**

Surface preparation procedures, specialized refinish materials, spray equipment and techniques used for custom painting on vehicle panels or small projects. Materials utilized include standard urethane (solvent-based) base coats, waterborne base coats, candy colors, pearls, and metal flakes. Masking and design transfer techniques for custom painting.

**Prerequisite(s):** ABDY2140

**ABDY2310 | Production II Internship | Internship (4 Credits)**

This Internship is offered for qualified students who are interested in fulfilling their 2nd year production requirement for the Collision Program via a 216 hour internship rather than participating in ABDY 2320 Production Lab II. Must be able to secure an internship at a collision repair facility and have the approval of the Collision program faculty. A formal agreement will be developed between the student, the employer, and an advisor assigned by Dunwoody. Internship must be approved by the Department Director of Internship Advisor.

**Prerequisite(s):** ABDY2222 And ABDY2210

**ABDY2320 | Summer Production Repair Lab II | Laboratory (4 Credits)**

Perform major and minor collision repairs; repair or replace structural members and exterior panels; remove and replace glass and upholstery; suspension and mechanical components; prepare panels for paint; refinish panels or vehicles as necessary. Create computerized repair estimates, discuss repairs with customers, order parts and assist in completion of repair orders for customer billing.

**Prerequisite(s):** ABDY2210 And ABDY2222

## Automated Systems & Robotics (ASRO)

**ASRO1210 | Mechanical Transmission of Power Lab | Laboratory (2 Credits)**

Assembling, disassembling and observing applications of bearings, gears, cams, motors, clutches, cylinders (hydraulic and pneumatic), fluid systems, mechanical systems and other automation related components. Drawing and fabrication of simple components.

**ASRO1220 | Mechanical Transmission of Power Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with various components of machines including bearings, gears, cams, motors, clutches, cylinders (hydraulic and pneumatic), fluid systems, mechanical systems and other automation related components.

**ASRO2100 | Industrial Controls & PLCs Lab | Laboratory (2 Credits)**

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

**ASRO2110 | Industrial Controls & PLCs Lab | Laboratory (5 Credits)**

Installation, wiring, programming, operation, testing and troubleshooting programmable logic controllers. Interfacing programmable logic controllers with switches, sensors, motors, pneumatics, and other I/O devices. Set-up, configuration and troubleshooting inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2120

**ASRO2120 | Industrial Controls & PLCs Theory | Lecture (8 Credits)**

Wiring and programming fundamentals associated with programmable logic controllers. Identification, recognition and calculations associated with inductive and capacitive proximity, photo-electric, temperature and other industrial sensors.

**Prerequisite(s):** ELTT1100 Or ELTT1110

**Corequisite(s):** ASRO2100 ASRO2110

**ASRO2200 | Automation & Robotics Lab | Laboratory (2 Credits)**

Set up, configuration, programming and troubleshooting industrial robots to meet industry standards. Configuration and troubleshooting of installed automation and packaging equipment using machine schematics and related documentation.

**Prerequisite(s):** ASRO2100

**Corequisite(s):** ASRO2205

**ASRO2205 | Automation & Robotics Theory | Lecture (8 Credits)**

Identification, recognition, programming and calculations associated with automation and packaging components, motion control, industrial robotics and related documentation.

**Prerequisite(s):** ASRO2120

**Corequisite(s):** ASRO2200

**ASRO2210 | Automation & Packaging Lab | Laboratory (2 Credits)**

Set up configuration and troubleshooting of installed automation and packaging equipment using machine schematics and related documentation.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ASRO2220

**ASRO2220 | Automation & Packaging Theory | Lecture (3 Credits)**

Identification, recognition and calculations associated with automation and packaging components, motion control, electrical safety, documentation, motors, control circuits and related documentation. Investigation of packaging and automation career options and industry related skills.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ASRO2210

**ASRO2230 | Industrial Robotics Lab | Laboratory (2 Credits)**

Set up, configuration, programming and troubleshooting industrial robots to meet industry standards. Industry safety standards, programming methods, applications and interfacing of sensors and I/O devices.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ASRO2240 ASRO2241

**ASRO2240 | Industrial Robotics Theory | Lecture (3 Credits)**

Identification, recognition and calculations associated with industrial robotics including terminology, safety practices and procedures, application justifications, robot types, operation, program instructions and techniques, I/O device interfacing, end of arm tooling, system integration and troubleshooting.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ASRO2230

**ASRO2241 | Industrial Robotics Theory | Lecture (5 Credits)**

Identification, recognition and calculations associated with industrial robotics including terminology, safety practices and procedures, application justifications, robot types, operation, program instructions and techniques, I/O device interfacing, end of arm tooling, system integration and troubleshooting.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ASRO2230

**ASRO2290 | Industrial Internship/Practicum | Practicum (3 Credits)**

Internship or practicum option on various manufacturing topics: automation, electronics, robotics, mechanical systems, assembly, troubleshooting, research and/or field service.

**ASRO2291 | Industrial Internship/Practicum | Internship (6 Credits)**

Internship or practicum option on various manufacturing topics: automation, electronics, robotics, mechanical systems, assembly, troubleshooting, research and/or field service.

## Automotive Service Technology (AUTO)

**AUTO1110 | General Skills & Engine Fundamentals | Lec/Lab (3 Credits)**

Use tools and measuring instruments. Identify fasteners and fittings, remove damaged fasteners, fabricate brake lines. Research service procedures using automotive information systems. Disassemble and assemble component engines. Describe engine parts, systems, and operation.

**AUTO1120 | Brakes, Steering & Suspensions | Lec/Lab (4 Credits)**

Examine theory of design and principles of operation, diagnosis and repair procedures of automotive brake, steering and suspension systems. Practice performing service procedures, four-wheel alignments, tire and wheel service.

**AUTO1130 | Electrical & Electronic Principles | Lec/Lab (7 Credits)**

Examine theory and principles of: Ohm's law, circuit principles, magnetism, electromagnetism, batteries, induction, cranking motors, charging systems, basic electronics including semiconductors. Use digital multimeters and wiring schematics to trace, test, and diagnose circuits. Disassemble, inspect, test, and reassemble starters and alternators. On-vehicle diagnosis of battery, starting, and charging systems.

**AUTO1210 | Engine Repair | Lec/Lab (3 Credits)**

Examine design and operating principles of engine systems. Disassemble, inspect, measure, and reassemble a complete running engine validated by proper operation when work is completed.

**Prerequisite(s):** AUTO1110 And AUTO1130

**AUTO1220 | Automatic Transmissions | Lec/Lab (3 Credits)**

Fundamentals of planetary gears, theory of operation of components and controls. Disassemble, inspect, and reassemble component automatic transmissions and transaxles. Practice maintenance and general testing procedures, pressure testing, electronic scan tool testing. Effective use of service information is emphasized.

**Prerequisite(s):** AUTO1120 And AUTO1130

**AUTO1230 | Accessories, Heating & Air Conditioning | Lec/Lab (6 Credits)**

Wiring circuit interpretation, accessory operation, lighting system design, circuit tracing, and service procedures. Diagnose and repair lighting, instrumentation, accessories, and air-bags. Heating/air conditioning component operation and physics. Control system diagnosis, service, repair procedures, and pressure diagnosis. On vehicle procedures for recovery/recycling equipment.

**Prerequisite(s):** AUTO1130

**AUTO2110 | Engine Performance | Lec/Lab (13 Credits)**

Analysis of the theory of operation, design, diagnosis, and repair procedures of engine control and computer systems. Examine emerging engine performance and vehicle propulsion technologies. Use standard and computerized tune-up test equipment to make a complete performance analysis and/or diagnosis of specific problems to determine the work needed on vehicles. Repairs are made to restore the vehicle's performance, emissions, and fuel economy to as near as possible to original factory and EPA standards.

**Prerequisite(s):** AUTO1230

**AUTO2210 | Drivetrain | Lec/Lab (3 Credits)**

Theory of operation, inspection, diagnosis, disassembly and reassembly of transmissions, transaxles and transfer cases. Design, principles of operation, diagnosis, troubleshooting and repair procedures for drive axles, drive shafts, universal joints, differentials and clutches. Oxyacetylene torch procedures.

**Prerequisite(s):** AUTO1210, AUTO1220, And AUTO1230

**AUTO2220 | Production | Lec/Lab (8 Credits)**

Practical shop experience in all aspects of automotive repair on customer's vehicle. Fundamentals of shop management, repair order writing, parts procurement, and customer relations. Principles of NVH (noise, vibration, and harshness) diagnosis, and advanced chassis control systems.

**Prerequisite(s):** AUTO1230, AUTO1220, And AUTO1210

**AUTO2230 | Auto Internship | Internship (8 Credits)**

Supervised training in repairing various problems with customer vehicles while working at an automotive repair facility. Need department director approval; must follow approved guidelines listed in the internship packet. This course can be taken in lieu of AUTO2220 Production.

**Prerequisite(s):** AUTO1210, AUTO1220, And AUTO1230

## Biology (BIOL)

**BIOL1230 | Anatomy | Lec/Lab (4 Credits)**

Analyze the structure of the human body, molecular, cellular to organism level. Examine cell biology, integumentary, muscular, skeletal, neurological, digestive, respiratory, urinary, cardiovascular, endocrine, lymphatic, and reproductive body systems and the correlation/integration of the various systems to construct the human organism.

**General Education:** Natural Sciences

**BIOL1310 | Physiology I | Lec/Lab (2 Credits)**

Analyze the functioning of the human body, molecular, cellular to organism level. Examine body systems, such as cell biology, muscular, skeletal, neurological, digestive and respiratory and the correlation/integration of the various systems in impacting the functioning of the human organism.

**Prerequisite(s):** BIOL1230

**General Education:** Natural Sciences

**BIOL1320 | Physiology II | Lec/Lab (2 Credits)**

Analyze the functioning of the human body, molecular, cellular to organism level. Examine body systems such as urinary, body defenses, cardiovascular, endocrine, lymphatic, and reproductive and the correlation/integration of the various systems in impacting the functioning of the human organism.

**Prerequisite(s):** BIOL1310

**General Education:** Natural Sciences

**BIOL1400 | Human Disease | Lec/Lab (4 Credits)**

Analysis of the disease conditions affecting the human body, including their pathological origin, signs and symptoms, pathological process, diagnostics, and treatment modalities.

**Prerequisite(s):** BIOL1320

**General Education:** Natural Sciences

## Chemistry (CHEM)

**CHEM2000 | Introduction to Chemistry | Lecture (3 Credits)**

Examine contemporary applications of chemistry in such areas as energy, technology and materials, pollution and waste. Applications illustrate many fundamental concepts in chemistry, such as molecular and electronic structure, mixtures, intermolecular forces, phase behavior, thermodynamics, electrochemistry, kinetics, and equilibria. Current and future global challenges are presented and discussed.

**General Education:** Natural Sciences

**CHEM2110 | Chemistry with Lab | Lec/Lab (4 Credits)**

Develop a basic understanding of the central principles of chemistry that are useful to explain and predict the properties of chemical substances based on their atomic and molecular structure; promotes the development of basic and advanced science process skills.

**General Education:** Physical Sciences with Lab

## Communication (COMM)

**COMM1010 | Business Communication | Lecture (3 Credits)**

Communication in the business world with written and verbal activities, such as memos, business letters, presentations, resumes, and an introduction to public speech making.

**General Education:** Communications

**COMM1030 | Project Communication | Lecture (3 Credits)**

Create effective communication strategies critical to project success using language and methodology to assess project communication needs, plan for meeting those needs, and effectively communicate project status and forecasts to all stakeholders throughout the project life cycle.

**General Education:** Communications



**COMM1150 | Interpersonal Communication | Lecture (3 Credits)**

Analyze the process of interpersonal communication as a dynamic and complex system of interactions. Integrate interpersonal communication theory into work, family and social relationships. Apply fundamental tools needed to provide quality customer service. Decision making, problem solving, and managing customer service processes are emphasized.

**General Education:** Communications

**COMM1910 | Communication Topics I | Lecture (1 Credit)**

Topics in communication selected by faculty assigned to the course.

**General Education:** Communications

**COMM1920 | Communication Topics II | Lecture (2 Credits)**

Communication Topics II focuses on topics in communication selected by faculty assigned to the course.

**General Education:** Communications

**COMM2000 | Communication for Technical Professions | Lecture (5 Credits)**

Develop the distinctive reading and writing skills critical to success in technical professions. Examine the role of and techniques used within the writing process; the interrelationship between content, language, and structure; and the relationship between the basic conventions of writing and the construction of meaning. Topics include strategies for collaborative and ethical writing in the workplace, creating and interpreting professional communications, and analyzing field-specific texts for application to a specific task and overall effectual performance.

**General Education:** Communications

**COMM3000 | Professional Communication | Lecture (2 Credits)**

Professional communication in all forms: researching, selecting, synthesizing, and documenting sources; business e-mail and letter writing, as well as public speaking and power point presentation for application in a management setting.

**General Education:** Upper Communications

**COMM3300 | Mass Media & Popular Culture | Lecture (2 Credits)**

Explore contemporary forms of mass media and genres of popular culture, such as print and broadcast journalism, branding and advertising, movies, sports, social media and music, to encourage active and thoughtful consumerism. Examine the role of mass culture in producing and reproducing basic social categories, such as racial and gender stereotypes. Identify how the media shapes politics.

**General Education:** Upper Communications

## Computer Networking Systems (CNTS)

**CNTS1111 | Computer Systems | Lec/Lab (4 Credits)**

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

**CNTS1121 | Network Fundamentals | Lec/Lab (3 Credits)**

Concept and terminology introductions, data communications in a business environment. Client-server networking; communication hardware, software, and basic security is introduced. Services and models supporting data communications interoperability introduced. Configure and troubleshoot basic network connections and the hardware/software associated.

**CNTS1130 | Desktop Business Applications | Lec/Lab (3 Credits)**

Operation of desktop business applications and how they apply to the business environment. Construct documents for real world applications in a variety of different business scenarios.

**CNTS1210 | Server Systems I | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage the primary services in the Microsoft Windows Server operating system. Introduction to the sharing of system resources, remote administration techniques to facilitate efficient and effective management of business computer systems.

**Prerequisite(s):** CNTS1110, Or CNTS1111, And CNTS1120, Or CNTS1121

**CNTS1220 | Routing & Switching I | Lec/Lab (5 Credits)**

Concepts and application of bridging, switching, and routing in an industry-standard networking environment. Install, configure, and manage networks, routers, and switches to facilitate basic network communication architectures. Portions of this course help to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNTS1120 Or CNTS1121

**CNTS1230 | Network Systems | Lec/Lab (4 Credits)**

Expansion of concepts and terminology of business data communications and how they apply to the business environment. Intermediate to advanced client-server networking concepts, including its associated networking hardware, addressing and services. Logical addressing, IP routing, and network protocols. Installation and configuration of client-server networking systems.

**Prerequisite(s):** CNTS1121

**CNTS2111 | Server Systems II | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage directory services for the network infrastructure including server deployment, terminal services, web services, network application services, planning, designing, and business continuity.

**Prerequisite(s):** CNTS1210

**CNTS2120 | Routing & Switching II | Lec/Lab (5 Credits)**

Advanced concepts and application of bridging, switching, and routing in an industry-standard networking environment. Practice advanced business network communication architectures. This course helps to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNTS1220

**CNTS2130 | Virtualization | Lec/Lab (3 Credits)**

Install, configure, maintain, and manage a variety of virtualization software; examine the underlying principles of virtualization; create a virtual IT infrastructure; advantages and disadvantages of moving to a virtualized environment; comparison of major virtualization software systems.

**Prerequisite(s):** CNTS1210

**CNTS2211 | Enterprise Application Administration | Lec/Lab (3 Credits)**

Install, configure, maintain, and manage Microsoft Exchange Server (email) and the considerations needed to optimize Exchange Server deployment. Managing and maintaining databases and multidimensional databases on Microsoft SQL Server. Development and deployment of SharePoint sites, security, database connectivity; administer and monitor SharePoint sites for use in a business setting.

**Prerequisite(s):** CNTS2111



**CNTS2223 | Open Source Software | Lec/Lab (4 Credits)**

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) with an emphasis on common web, file and database servers found in industry; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry. In-depth coverage of technologies related to hosting websites including programming language support, database support/connectivity, and remote access.

**CNTS2240 | Administrative Scripting | Lec/Lab (3 Credits)**

Programming techniques that apply to managing computer systems and networks. Programming and its best practices, methods of code writing, and development of real world scripts used to manage enterprise networks.

**CNTS2250 | Career Preparation | Lecture (1 Credit)**

Design a business resume, cover letter and thank you letter; implement a job search strategy, and submit resume, cover letter and thank you letter in search of an entry level job. Assemble artifacts for a student portfolio, create the portfolio, and present it to industry professionals.

## Computer Networking Technician (CNET)

**CNET1110 | Computer Systems | Lec/Lab (5 Credits)**

Apply electronic theory, Boolean logic, utilization of hex editors and assembly language to understand the underpinning technologies that make computers systems work. Maintenance and repair of computer operating systems, hardware, peripherals, and component selection/installation for machines commonly found in a business.

**CNET1120 | Network Fundamentals | Lec/Lab (5 Credits)**

Concepts and terminology of business data communications and how it applies to the business environment. Introduction to client-server networking, associated networking devices, and services required to support a network and the current models governing interoperability. Portions of this course will provide preparation for the CompTIA Network + Certification.

**CNET1210 | Server Systems I | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage the primary services in the Microsoft Windows Server operating system. Introduction to the sharing of system resources, remote administration techniques to facilitate efficient and effective management of business computer systems.

**Prerequisite(s):** CNET1110 And CNET1120

**CNET1220 | Routing & Switching I | Lec/Lab (5 Credits)**

Concepts and application of bridging, switching, and routing in an industry-standard networking environment. Install, configure, and manage networks, routers, and switches to facilitate basic network communication architectures. Portions of this course help to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNET1120

**CNET2110 | Server Systems II | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage directory services for the network infrastructure including server deployment, terminal services, web services, network application services, planning, designing, and business continuity.

**Prerequisite(s):** CNET1210

**CNET2120 | Routing & Switching II | Lec/Lab (5 Credits)**

Advanced concepts and application of bridging, switching, and routing in an industry-standard networking environment. Practice advanced business network communication architectures. This course helps to prepare for the Cisco Certified Networking Associate (CCNA) exam.

**Prerequisite(s):** CNET1220

**CNET2210 | Enterprise Application Administration | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage Microsoft Exchange Server (e-mail) and the considerations needed to optimize Exchange Server deployment. Managing and maintaining databases and multidimensional databases on Microsoft SQL Server. Development and deployment of SharePoint sites, security, database connectivity; administer and monitor SharePoint sites for use in a business setting.

**Prerequisite(s):** CNET2110

**CNET2220 | Open Source Software | Lec/Lab (5 Credits)**

Install, configure, maintain, and manage a wide variety of Open Source Software (OSS) including OSS desktop productivity software; the history of the open source movement. Configure OSS operating systems to support common client-servers, Web hosting, and other services commonly found at the enterprise and ISP levels of industry.

## Computer Systems Analysis (BCSA)

**BCSA3100 | Computer Architecture | Lec/Lab (3 Credits)**

Introduction to computer architecture, processors, instruction sets, and assembly language programming.

**BCSA3110 | Discrete Mathematics | Lecture (3 Credits)**

Examine the logic-related mathematical background necessary for upcoming courses. Topics include: logic, sets, functions (as defined in the Mathematics domain), sequences, algorithmic complexity, number theory, matrices, proof of complexity, mathematical induction, recursion, counting, probability, and graph and tree fundamentals.

**BCSA3120 | Systems Analysis Practicum | Practicum (3 Credits)**

Survey of the various approaches for software development from traditional systems analysis to contemporary agile methods, Unified Modeling Language (UML), and object-oriented design. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

**BCSA3130 | Management of Distributed Systems | Practicum (3 Credits)**

Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

**BCSA3200 | Operating Systems | Lec/Lab (3 Credits)**

Analyze the purpose of operating systems. Topics include: elements of operating systems, memory and process management, interactions among major components of computer systems, and an examination of the effects of computer architecture on operating systems.

**Prerequisite(s):** BCSA3100

**BCSA3210 | Algorithms/Data Structures | Lec/Lab (3 Credits)**

Investigate the creation of algorithms, the study of the running time or complexity of the proposed solution, and interesting related problems with algorithms, including some which cannot be solved by machines. Review well-known algorithms, including those in the areas of searching, sorting, scheduling, tree and graph traversal to understand algorithms and the data structures used to solve them efficiently, like linked lists, stacks, queues, and recursion structures.

**Prerequisite(s):** BCSA3110

**BCSA4100 | Security | Lec/Lab (3 Credits)**

Explore fundamental and emerging concepts of computer security. Topics include: maintaining information confidentiality, protecting information integrity, assuring information availability, physical, technical, application, and Internet security, social engineering and associated attacks.

**BCSA4110 | Formal Languages & Automata | Lec/Lab (3 Credits)**

Determine how proper programming languages and systems are created. Examine formal logic and models of computation including finite state automata, pushdown automata, and Turing machines. Investigate problems for which a formal solution is not possible, problems which cannot be solved by finite, or real, machines, and problems for which complete solutions are not possible but 'good enough', or heuristic solutions.

**Prerequisite(s):** BCSA3210

**BCSA4120 | Database Technologies | Practicum (3 Credits)**

Database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

**BCSA4130 | Management Information Systems II | Practicum (3 Credits)**

Examine budgeting, how to write RFP's (Request for Proposal), contract management, capacity planning, operations and user support, orphan ware, writing and enforcing policies. Identify aspects of security in software programs, social engineering, and network security.

**BCSA4200 | Capstone | Capstone (3 Credits)**

An industry (field)-specific capstone project of student's choice. Present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** BCSA4100 And BCSA4110

**BCSA4210 | Software Engineering | Lec/Lab (2 Credits)**

Introduction to software engineering as an area of computer science. Focused study of requirements and requirements engineering; overview of various modeling techniques applicable to requirements and specifications, including UML and formal modeling.

**BCSA4220 | Quality Assurance & Testing | Lec/Lab (2 Credits)**

Theoretical and practical aspects of testing software. Analyze requirements documents through executing test cases and writing a test report. Investigate the types of testing that should be done, who should do it, when are we done, and why it should be done at all. Identify the life cycle issues related to development and maintenance, quality, safety, and security assurance, project management, and automated support environments. Practice the skill set required to organize and carry out the software testing phase for any small or medium-size software project.

**BCSA4230 | Network Architecture | Lec/Lab (2 Credits)**

Concepts and fundamental principles in modern network design and implementation that span LAN/WAN using TCP/IP and Ethernet. Review of topics related to layered models such as the OSI and TCP/IP logic models. Particular focus on the areas of network design and optimization. Specification of a network's physical and logical components and their function related to facilitating business processes, as well as network testing and documentation for the purpose of analyzing current architectures for improved performance.

**BCSA4240 | Data Architecture | Lec/Lab (2 Credits)**

Practical applications surrounding the modeling and querying of database systems. Concepts at a higher level than the typical database course, focusing on data models, data manipulation languages, extension of data types and data design and how that differs from database design.

## Construction Management (CMGT)

**CMGT1111 | The Construction Industry | Lecture (2 Credits)**

Aspects of the construction industry presented using interviews with practicing professionals, site tours, and exploratory reflections to illustrate the many opportunities available as a professional.

**CMGT1131 | Construction Plans & Measurements | Lecture (3 Credits)**

Interpret architectural and engineering graphics and conventions using construction documents to identify materials and calculate quantities.

**CMGT1210 | Construction Estimating I | Lec/Lab (4 Credits)**

Integrate material quantities with costs through take-offs, estimates and bid analysis, to predict project costs.

**Prerequisite(s):** CMGT1131

**CMGT1211 | Construction Estimating I | Lec/Lab (3 Credits)**

Integrate material quantities with costs through take-offs, estimates and bid analysis, to predict project costs.

**Prerequisite(s):** CMGT1131

**CMGT1220 | Construction Materials & Methods II | Lec/Lab (4 Credits)**

Examine building materials and construction methods through deconstruction of building systems using case studies, field trips and hands on exercises to figure out how buildings are assembled. Emphasis on the methods and materials for the interior of buildings.

**CMGT1221 | Construction Materials & Methods II | Lec/Lab (3 Credits)**

Examine building materials and construction methods through deconstruction of building systems using case studies, field trips and hands on exercises to figure out how buildings are assembled. Emphasis on the methods and materials for the interior of buildings.

**CMGT1230 | Construction Planning & Scheduling I | Lec/Lab (4 Credits)**

Analyze a sequence of construction tasks using network diagrams, Gantt charts, and the critical path method to create a project schedule.

**Prerequisite(s):** CMGT1131

**CMGT1231 | Construction Planning & Scheduling I | Lec/Lab (3 Credits)**

Analyze a sequence of construction tasks using network diagrams, Gantt charts, and the critical path method to create a project schedule.

**Prerequisite(s):** CMGT1131

**CMGT1310 | Construction Topics I | Seminar (1 Credit)**

Investigate a selected topic in various areas of construction allowing a problem of special interest to be further examined.

**CMGT1313 | Construction Contracts | Lecture (1 Credit)**

Introduction to construction administration documents, systems, and procedures to understand the construction contracting process including planning and scheduling the job, bidding through closeout to meet project requirements.

**CMGT1315 | Service Learning I | Seminar (1 Credit)**

Practice construction management through service construction projects and public/non profit partnerships to increase skills and build community.

**CMGT1901 | International AEC Fields & Practices | Travel Study (1 Credit)**

Introduction to the international aspects of architecture, engineering, and construction industries. Emphasis on inter-cultural communication, cultural intelligence, and globalization of technology. Four traditional classroom sessions (held before travel) include lectures, seminar discussions, case studies, participatory activities, and guest speaker presentations. Coursework during travel is primarily experiential based and includes fieldwork, group projects and community based service-learning. Travel expenses are incurred by the student.

**CMGT2130 | Construction Safety | Lecture (3 Credits)**

Examine the principles of construction safety and identify health hazards using the Occupational Safety and Health Administration (OSHA) 1926 Construction Industry Regulations and MNOSHA Laws and Rules. Emphasis is on OSHA 30-hour Construction standards, to develop strategies to prevent injuries on construction projects. Awareness education for asbestos, PCB's (polychlorinated biphenyl), VOC's (volatile organic compounds), mold and lead.

**CMGT2131 | Construction Safety | Lecture (2 Credits)**

Examine the principles of construction safety and identify health hazards using the Occupational Safety and Health Administration (OSHA) 1926 Construction Industry Regulations and MNOSHA Laws and Rules. Emphasis is on OSHA 30-hour Construction standards.

**CMGT2150 | Residential Project Management | Laboratory (3 Credits)**

Integrate residential project management skills to create and coordinate plans, schedules, and estimates for a site development residential project utilizing construction competition guidelines.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CMGT2203 | Construction Mgmt Statics & Structures | Lecture (3 Credits)**

Evaluate structural behavior, structural materials, and load resistance for vertical and horizontal projects. Focus is on how construction managers work with designers.

**Prerequisite(s):** MATH1050

**CMGT2210 | Integrated Environmental Systems | Lecture (4 Credits)**

Examine mechanical, electrical, plumbing and fire protection systems using case studies to coordinate the integration of these disciplines.

**CMGT2211 | Integrated Environmental Systems | Lecture (3 Credits)**

Examine mechanical, electrical, plumbing and fire protection systems using case studies to coordinate the integration of these disciplines.

**CMGT2220 | Construction Administration | Lecture (3 Credits)**

Examine the requirements of Construction Administration using industry standard formats and procedures to understand the administrative requirements for their implications on a construction project. Principles of mitigating construction liability and risk are addressed through case studies and construction documents to select the appropriate method of risk management for a construction project.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CMGT2221 | Construction Administration | Lecture (2 Credits)**

Examine the requirements of Construction Administration using industry standard formats and procedures to understand the administrative requirements for their implications on a construction project.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CMGT2230 | Commercial Project Management | Laboratory (3 Credits)**

Manage a construction project from Request for Proposals through closeout integrating software; best practices and ethical decision making illustrate the competencies required of a construction project manager/site supervisor. Emphasis on overall culmination of prerequisite skills achieved in prior courses.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CMGT2500 | Project Management: NAHB 2 yr Competitio | Laboratory (3 Credits)**

Integrate residential project management with documentation prepared for review by an industry review panel and a presentation at the National Association of Home Builders (NAHB) annual student competition. Emphasis is on creation and coordination of plans, schedules and estimates. Students are selected by faculty to register for this course.

**Prerequisite(s):** CMGT1210, CMGT1211, CMGT1230, And CMGT1231

**CMGT3110 | Construction Law | Lecture (4 Credits)**

Examine the components of Construction Law using case law studies and construction documents to understand and identify the legal issues and liabilities encountered in connection with a construction project. The focus is on the obligations and liabilities that arise for general contractors, subcontractors, property owners and other project stakeholders from key ?boilerplate? construction contract language or local, state and federal law.

**CMGT3111 | Construction Law | Lecture (3 Credits)**

Examine the components of Construction Law using case law studies and construction documents to understand and identify the legal issues and liabilities encountered in connection with a construction project.

**CMGT3120 | Construction Estimating II | Lec/Lab (4 Credits)**

Advanced analysis of the quantity surveying, cost estimating, and bidding methods of building construction using current industry practices and methods to oversee and manage the successful procurement of projects.

**CMGT3121 | Construction Estimating II | Lec/Lab (3 Credits)**

Advanced analysis of the quantity surveying, cost estimating, and bidding methods of building construction using current industry practices and methods to oversee and manage the successful procurement of projects.

**CMGT3130 | Quality Assurance & Risk | Lecture (3 Credits)**

Analyze the best allocation of people, processes, material, and equipment based on quality and productivity principles and expectations to maintain an efficient and safe work environment.

**CMGT3210 | Construction Accounting & Finance | Lecture (4 Credits)**

Apply basic accounting and finance concepts in the construction industry to analyze project data and financial statements to forecast, monitor and manage the costs of a construction project. Analyze the unique characteristics of construction accounting and finance through their use in budget development, securing funding, and cash flow to forecast the implementation of business decisions on financial statements.

**CMGT3211 | Construction Accounting & Finance | Lecture (3 Credits)**

Apply basic accounting and finance concepts in the construction industry to analyze project data and financial statements to forecast, monitor and manage the costs of a construction project. Analyze the unique characteristics of construction accounting and finance through their use in budget development, securing funding, and cash flow to forecast the implementation of business decisions on financial statements.

**CMGT3220 | Construction Planning & Scheduling II | Lec/Lab (4 Credits)**

Advanced principles and techniques of managing construction schedules to forecast and report progress for construction projects.

**CMGT3221 | Construction Planning & Scheduling II | Lec/Lab (3 Credits)**

Advanced principles and techniques of managing construction schedules to forecast and report progress for construction projects.

**CMGT4005 | Professional Development | Directed Study (4 Credits)**

Develop and implement a customized plan which identifies areas of focus to be a successful graduate. Emphasis is on completing an internship, professional development, or alternative project.

**CMGT4006 | Professional Development | Directed Study (1 Credit)**

Integrate managerial and leadership skills in a related industry setting to acquire real world experience in an area of student interest.

**CMGT4110 | Project Management: 4yr CM Competition | Laboratory (3 Credits)**

Integrate residential project management with documentation prepared for review by an industry review panel and a presentation at an industry sponsored national student competition. Emphasis is on creation and coordination of plans, schedules, estimates, finance, marketing analysis, risk, insurance, and green initiatives for a site development project. Students are selected by faculty to register for this course.

**CMGT4120 | Field Engineering | Lecture (3 Credits)**

Analyze statics and strength of materials as used for the application of material specifications, quality control, and testing required in the field. Emphasis on field documentation and verification of subcontractor work.

**CMGT4130 | Green Construction | Lecture (3 Credits)**

Examine green building principles and best practices through laboratory exercises, research, discussions, case studies, and presentations; apply to industry documents to understand the green building industry.

**CMGT4131 | Construction Elective | Lecture (3 Credits)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4132 | Construction Elective | Lecture (2 Credits)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4134 | Construction Elective | Lecture (4 Credits)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4135 | Construction Elective | Lecture (5 Credits)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4136 | Construction Elective | Lecture (6 Credits)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4137 | Construction Elective | Lecture (1 Credit)**

Orientation to a selected topic through a study of contractor's relationship to society, specific clients, their professions, and other collaborators in the construction industry.

**CMGT4210 | Construction Topics II | Lecture (4 Credits)**

Investigate a selected topic in various areas of construction allowing a problem of special interest to be further examined.

**CMGT4211 | Construction Topics II | Lecture (3 Credits)**

Investigate a selected topic in various areas of construction allowing a problem of special interest to be further examined.

**CMGT4220 | Utility & Construction Design | Lecture (3 Credits)**

Examine the infrastructure systems related to public works projects produced in the United States; presented and discussed through a series of speakers, field trips and readings in order for construction professionals to realize the importance of our infrastructure systems and how they affect our society, including an analysis of current and future needs.

**CMGT4500 | Project Management Capstone | Capstone (3 Credits)**

Integrate residential project management with documentation prepared for review by an industry review panel. Emphasis is on creation and coordination of plans, schedules, estimates, finance, marketing analysis, risk, insurance, and green initiatives for a site development project.

**CMGT4501 | Project Management | Lecture (3 Credits)**

Integrate project management with documentation prepared for review by an industry review panel. Emphasis is on creation and coordination of plans, schedules, estimates, finance, marketing analysis, risk, insurance, and green initiatives for a site development project.

## Construction Sciences & Building Tech (CSBT)

**CSBT1000 | AEC Seminar | Seminar (1 Credit)**

Introduction to the academic and classroom culture. Develop a proficiency in communication skills including research, oral presentation, writing, and collaboration.

**CSBT1002 | Construction Drafting | Lec/Lab (3 Credits)**

Implement construction graphics and conventions using hand drafting and drawing software.

**CSBT2000 | Professional Development | Seminar (1 Credit)**

Apply technical skills in a related industry setting to acquire real world experience in an area of student interest.

**CSBT2110 | Building Codes | Lecture (3 Credits)**

Select and apply appropriate federal, state/provincial and municipal codes, standards and accessibility guidelines using industry standards with an emphasis on Life Safety Codes and the ADA to prepare for licensing exams, meet with codes officials, and to design spaces that enhance the health, safety and welfare of the general public.

## Design for Manufacturing 3D Printing (3DPT)

**3DPT2100 | 3D Printing Applications | Lecture (5 Credits)**

Explore traditional, additive and hybrid applications in the core manufacturing processes. Design and print prototype parts and tools to be used in various manufacturing processes.

**Prerequisite(s):** MDES1110

**3DPT2200 | Advanced 3D Printing Applications | Lecture (5 Credits)**

Design 3D printed tooling for traditional manufacturing processes. Utilize tools in metal-casting, thermoforming, jigs, fixtures and other applications.

**Prerequisite(s):** 3DPT2100

## Economics (ECON)

**ECON1000 | Introduction to Micro & Macro Economics | Lecture (3 Credits)**

Fundamental economic issues and theories are explored through discussion and research. Current events, policy perspectives, and case studies are used to process and apply economics to everyday life.

**General Education:** Social Sciences



# Electrical Const Design & Management (ECDM)

## **ECDM2101 | Electrical Theory & Practice - Delta | Lecture (3 Credits)**

Principles and practices of electrical system design. Design and calculations involved in electrical construction. Apply occupant perspectives, construction techniques, and relevant codes. Examine the entire electrical system, with a focus on branch circuits and low voltage systems.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2102

## **ECDM2102 | Design Lab - Delta | Laboratory (3 Credits)**

Electrical design of a simulated building project. This project covers utility to outlets, with a focus on branch circuits and low voltage systems. Practical design implementation is emphasized. Detailed documentation of all aspects of the project. CAD, Revit, and other modeling and analysis software is used to produce a final portfolio.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2101 ECDM2103

## **ECDM2103 | Illumination Technology & Design | Lec/Lab (4 Credits)**

Interior and exterior applications of lighting. Discussion of energy code, including control system implementation and lighting power density. Analyze photometric data and their application. Use 3D modeling to design layouts, taking into account fixture selection and basic aesthetic considerations.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2102

## **ECDM2110 | Electrical Commercial Design Project | Laboratory (3 Credits)**

Electrical design and project management of a simulated commercial building project. The project involves lighting, power and low voltage systems. Detailed documentation of all aspects of the project for external review. CAD (Computer Aided Drafting) and Revit stations are utilized to simulate a design environment.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2120 ECDM2130

## **ECDM2120 | Electrical Commercial Design Theory | Lecture (3 Credits)**

Various principles, practices and required codes as utilized in commercial electrical construction; involves lighting systems solutions, selection of power systems, and low voltage systems. Scheduling and project management practices are emphasized.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2110 ECDM2130

## **ECDM2130 | Electrical Commercial Design Calculation | Lecture (3 Credits)**

Various mathematical skills for calculations involved in electrical construction in commercial buildings; involves lighting systems applications, power systems applications, and low voltage systems selection. Scheduling and project management practices use calculation procedures.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2110 ECDM2120

## **ECDM2140 | Electrical Residential Design Project | Laboratory (2 Credits)**

Electrical design of a simulated residential multi-family dwelling. The project involves lighting systems, power systems and low voltage systems. Detailed documentation of all aspects of the project. Basics of computer-assisted design (CAD & Revit) will assist in the production of drawings and documentation.

**Prerequisite(s):** ELEC1210, ELEC1220, And ELEC1230

**Corequisite(s):** ECDM2150

## **ECDM2150 | Electrical Residential Dsgn Application | Lecture (2 Credits)**

Various principles, practices and codes as utilized in residential electrical construction; involves lighting systems design, power systems, and low voltage systems. Calculate lighting design solutions and other industry-standard computations for residential design.

**Prerequisite(s):** ELEC1210, ELEC1220, And ELEC1230

**Corequisite(s):** ECDM2140

## **ECDM2201 | Electrical Theory & Practice - Omega | Lecture (3 Credits)**

Principles and practices of electrical system design. Design and calculations involved in electrical construction. Apply occupant perspectives, construction techniques, and relevant codes. Examine the entire electrical system, with a focus on distribution, such as transformers, generators, panels, and feeders.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2202

## **ECDM2202 | Design Lab - Omega | Laboratory (3 Credits)**

Electrical design of simulated building project. This project covers utility to outlets, with a focus on distribution, such as transformers, generators, panels and feeders. Practical design implementation is emphasized. Detail documentation of all aspects of the project. Use contemporary 2D, 3D, and other modeling and analysis software to produce a final portfolio.

**Prerequisite(s):** ELEC1111

**Corequisite(s):** ECDM2201

## **ECDM2203 | Electrical Estimating | Lecture (3 Credits)**

Detailed estimation and project management of electrical construction projects using industry software. Scheduling and bidding of construction projects and project documentations.

## **ECDM2204 | Electrical Field Studies | Laboratory (1 Credit)**

Explore electrical systems in completed construction, and converse with owners and facility managers to discuss implications of design. Tour in-progress projects, and discuss project management obstacles and best practices.

## **ECDM2210 | Electrical Industrial Design Project | Laboratory (3 Credits)**

Electrical design and project management of a simulated multiple-use building project; involves lighting systems, power systems, low voltage systems, scheduling and project management. Detailed drawings and documentation of all aspects of the project for external review.

**Prerequisite(s):** ECDM2110, ECDM2120, ECDM2130, ECDM2140, And ECDM2150

**Corequisite(s):** ECDM2220 ECDM2230

## **ECDM2220 | Electrical Industrial Design Theory | Lecture (3 Credits)**

Various principles, practices and codes utilized in industrial electrical construction; involves lighting systems, power transformation and distribution systems, control and low voltage systems. Scheduling and project management for a complex, commercial/industrial project.

**Prerequisite(s):** ECDM2110, ECDM2120, ECDM2130, ECDM2140, And ECDM2150

**Corequisite(s):** ECDM2210 ECDM2230



**ECDM2230 | Electrical Industrial Design Calculation | Lecture (3 Credits)**

Mathematical skills for principles, practices and code computations as utilized in electrical construction of a multiple use building; involves total integration of all electrical systems for a complete building design. Procedures and practices used (including appropriate computer software) for scheduling and project management.

**Prerequisite(s):** ECDM2110, ECDM2120, ECDM2130, ECDM2140, And ECDM2150

**Corequisite(s):** ECDM2210 ECDM2220

**ECDM2240 | Electrical Estimating & Management Lab | Laboratory (2 Credits)**

Detailed estimation and project management of residential, commercial and industrial electrical construction projects using industry software. Scheduling and bidding of construction projects and project documentations.

**Prerequisite(s):** ECDM2210, ECDM2220, And ECDM2230

**Corequisite(s):** ECDM2250

**ECDM2250 | Electrical Estimating & Management Apps | Lecture (2 Credits)**

Process of estimation and project management for electrical construction projects; scheduling and bidding of construction projects and project documentations.

**Prerequisite(s):** ECDM2210, ECDM2220, And ECDM2230

**Corequisite(s):** ECDM2240

**ECDM2301 | Advanced Topics & Technology | Lecture (3 Credits)**

Building on the design theory and labs, in depth analysis of specific electrical design applications, such as residential, medical, data centers, industrial, and other construction. Examine emerging technologies, such as renewable energy and building automation.

**Prerequisite(s):** ELEC1111

**ECDM2302 | Design Capstone | Laboratory (3 Credits)**

Integration of all aspects of electrical construction design and management, including drafting, designing, estimating, and managing projects, to create a complete comprehensive capstone project. The capstone project is presented and reviewed by industry experts and leaders, providing valuable feedback from their own experiences.

**Prerequisite(s):** ECDM2102 And ECDM2202

**ECDM2303 | ECDM Co-op/Internship | Directed Study (3 Credits)**

The Co-op or Internship course allows students to gain credit for work experience. In either option, students must have faculty approval before registering for this course. The Co-op Track is an educational experience combining academic and career interests with industry experience, offering the opportunity to test career interests, such as design, estimating, or project management. Students are paired with one or two companies over the course of a semester. Through the Co-op Option students are empowered to create a career plan enabling them to make well-informed choices for early career success. The Internship Track is a work experience in a typical company scenario. Students work on real and current projects that allow them to explore the difference in scope and types of work that exist outside the academic classroom.

**Prerequisite(s):** ECDM2102 And ECDM2203

## Electrical Construction & Maintenance (ELEC)

**ELEC1111 | AC & DC Electrical Lab | Laboratory (5 Credits)**

Investigation and application of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, test equipment, circuit connections, and analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1112

**ELEC1112 | AC & DC Electrical Principles | Lecture (8 Credits)**

Examination of electronics and electrical alternating and direct current principles and theories utilizing electrical math, basic schematics, and circuit analysis techniques to identify and predict electrical and electronic component and circuit behaviors.

**Prerequisite(s):** EENG4150

**Corequisite(s):** ELEC1111

**ELEC1211 | AC & DC Machines & Controls Lab | Laboratory (5 Credits)**

Investigation and analysis of AC and DC machines with both industrial and programmable logic control systems utilizing schematics and components to create and build electrical circuits with the inclusion of testing and troubleshooting procedures of equipment for a comprehensive analysis of industrial manufacturing systems.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC1212

**ELEC1212 | AC & DC Machines Principles | Lecture (8 Credits)**

Examination of DC and AC machine principles and theories with an emphasis on industrial manufacturing system calculations and analysis including use of the National Electrical code regulations for installations.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC1211

**ELEC2111 | Wiring & Electrical Systems Lab 1 | Laboratory (5 Credits)**

Implementation and installation of electric equipment, wiring methods and print reading for residential, light commercial and limited energy systems performed in a lab environment using proper safety practices and procedures.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2112

**ELEC2112 | Wiring & Electrical Systems Principles 1 | Lecture (8 Credits)**

Interpretation of the National Electrical Code and related calculations are examined and used to determine proper installation and use of wiring methods, devices and equipment in accordance with the National Electrical Code with a focus on residential and limited energy systems.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2111

**ELEC2211 | Wiring & Electrical Systems Lab 2 | Laboratory (5 Credits)**

Implementation of wiring methods for the installation of commercial, industrial, and renewable energy applications with an emphasis on various electrical systems utilizing blue prints, electrical schematics, estimating and take-off, and applicable industry standards along with the National Electrical Code within a laboratory environment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2212

**ELEC2212 | Wiring & Electrical Systems Principles 2 | Lecture (8 Credits)**

Examination of the methods and materials used for the design, operation, estimation, layout and installation of commercial, industrial, and renewable energy electrical systems utilizing applicable industry standards along with the National Electrical code.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELEC2211

## Electrical Engineering (EENG)

**EENG1110 | Programming for Electrical Engineers | Lecture (3 Credits)**

Introduction to programming principles and the C++ programming language for electrical engineers. Discuss universal programming topics relevant across languages. Distinguish the differences between programming languages and for which functions each one is commonly used. The C++ programming language is covered in-depth to provide specific examples for these principles and supply a foundation on which future programming curriculum can build.

**EENG1210 | Logic & Digital Design | Lecture (2 Credits)**

Introduction to logic gates and state machines. The foundations of number systems and binary logic are implemented using logic gates. Karnaugh maps are used to realize Boolean algebra, leading to combinational logic circuits. State machines such as flip-flops, counters, and registers are analyzed.

**Prerequisite(s):** ECDM2102 And ECDM2203

**Corequisite(s):** EENG1220

**EENG1220 | Logic & Digital Design Lab | Laboratory (1 Credit)**

Build logic circuits and state machines in a laboratory environment from scratch using components such as IC chips and breadboards. Measure inputs and outputs using oscilloscopes and logic analyzers. Explore potential uses and implementations for real world solutions. Model design with Hardware Description Language coding.

**Prerequisite(s):** ECDM2102 And ECDM2203

**Corequisite(s):** EENG1210

**EENG1230 | Circuit Fundamentals I | Lecture (2 Credits)**

Analyze fundamental circuits. Investigate the relationship between voltage, current, power and energy. Identify and predict responses of RC and RL circuits.

**EENG2110 | Circuit Fundamentals II | Lecture (2 Credits)**

Examine transient and steady state conditions in complex circuits. Investigate power, power factor, and power transfer. Explore frequency using Fourier analysis, Bode plots, passive filters and transfer functions.

**Prerequisite(s):** EENG1230

**Corequisite(s):** EENG2120

**EENG2120 | Circuit Fundamentals II Lab | Laboratory (1 Credit)**

Prototype various circuits and determine values using electrical metrology tools and techniques. Compare expected behavior against measured responses.

**Prerequisite(s):** EENG1230

**Corequisite(s):** EENG2110

**EENG2130 | Digital Systems | Lecture (3 Credits)**

Examine various systems through abstraction from the basic concepts of digital blocks. Starting with memory and programmable logic devices, progressing to basic microcontroller architecture to understand where systems are implemented.

**Prerequisite(s):** EENG1210

**EENG2210 | Analog Circuits | Lecture (3 Credits)**

Analysis of continuous variable systems. Discuss non-linear components such as diodes and transistors. Explore more advanced concepts and components including multi-transistor amplifiers and op-amps.

**Prerequisite(s):** EENG2110

**Corequisite(s):** EENG2220

**EENG2220 | Analog Circuits Lab | Laboratory (1 Credit)**

Design and construct circuits, focusing on prototyping and debugging, using common electrical engineering equipment and tools.

**Prerequisite(s):** EENG2120

**Corequisite(s):** EENG2210

**EENG2230 | Semiconductor Fundamentals | Lecture (4 Credits)**

Examine the theory and design of semiconductor devices prevalent in electrical engineering systems. Study the fabrication of diodes, transistors, and photovoltaic cells.

**EENG3110 | Advanced Analog Circuits | Lecture (3 Credits)**

Evaluate various typologies of circuits and determine useful implementations. Practical design considerations include physical constraints, non-ideal characteristics of transistors, active loads, frequency response, and feedback.

**Prerequisite(s):** EENG2210

**Corequisite(s):** EENG3120

**EENG3120 | Advanced Analog Circuits Lab | Laboratory (1 Credit)**

Design, model, prototype, and fabricate project(s) in an interactive applied lab.

**Prerequisite(s):** EENG2220

**Corequisite(s):** EENG3110

**EENG3130 | Signals & Systems Theory | Lecture (4 Credits)**

Introduction to the foundation of communications, signal processing and control theory. Use mathematical tools such as Fourier, Laplace, and Z transforms.

**Prerequisite(s):** MATH2820

**EENG3140 | Electrodynamics I | Lecture (3 Credits)**

In depth discussion of electric and magnetic fields. Explore Maxwell's equations.

**Prerequisite(s):** MATH2810

**EENG3210 | Advanced Digital Systems | Lecture (4 Credits)**

Investigate memory, data busses, and peripheral interfaces. Implement field-programmable gate arrays (FPGAs), microcontrollers, and embedded programming.

**Prerequisite(s):** EENG2130

**Corequisite(s):** EENG3220

**EENG3220 | Advanced Digital SystAdv Digital Sys Lab | Laboratory (1 Credit)**

Implement digital systems using different platforms and different programming languages. Demonstrate the design considerations for systems ranging from basic to complex applications.

**Prerequisite(s):** EENG2130

**Corequisite(s):** EENG3210

**EENG3230 | Electrodynamics II | Lecture (3 Credits)**

Analyze Maxwell's equations in vacuum and matter. Calculate absorption, dispersion and wave guides. Discuss the impact of relativity on electrodynamics.

**Prerequisite(s):** EENG3140

**EENG3240 | Mechatronics | Lecture (4 Credits)**

Mechatronics engages multiple disciplines in a system. Integrate typical aspects such as electrical drives, sensors, control systems, and communication.

**Prerequisite(s):** EENG3140

**Corequisite(s):** EENG3250

**EENG3250 | Mechatronics Lab | Laboratory (1 Credit)**

Interdisciplinary lab. Apply motive forces, implement control systems, and discuss operating environment challenges.

**Prerequisite(s):** EENG3140

**Corequisite(s):** EENG3240

**EENG4110 | Communication Systems I | Lecture (3 Credits)**

Apply signal and system theory to analog and digital communication. Distinguish characteristics of contemporary communication standards.

**Prerequisite(s):** EENG3110, EENG3130, And EENG3210

**Corequisite(s):** EENG4120

**EENG4120 | Communication Systems I Lab | Laboratory (1 Credit)**

Implement and evaluate electrical communication systems in an investigative laboratory.

**Prerequisite(s):** EENG3110, EENG3130, And EENG3210

**Corequisite(s):** EENG4110

**EENG4140 | Power System Analysis | Lecture (3 Credits)**

Examine how modern power systems are implemented and analyze how power moves through these systems.

**Prerequisite(s):** EENG3230

**EENG4150 | Senior Design Project I | Lecture (2 Credits)**

Investigate current real world electrical engineering industries, applications, and challenges. Prepare and present a project proposal to an industry panel. Discuss best practices in project management. Projects will be executed in the following semester.

**EENG4210 | Biomedical Topics | Lecture (2 Credits)**

Explore electrical engineering topics in the biomedical field. Discuss FDA.

**Prerequisite(s):** EENG3230

**Corequisite(s):** EENG4220

**EENG4220 | Biomedical Topics Lab | Laboratory (1 Credit)**

Hands on application of electrical engineering topics in the biomedical field.

**Prerequisite(s):** EENG3230

**Corequisite(s):** EENG4210

**EENG4230 | Communication Systems II | Lecture (3 Credits)**

Discuss current challenges, cutting edge and emerging technologies.

**Prerequisite(s):** EENG4110

**EENG4240 | Power System Design | Lecture (3 Credits)**

Examine how modern power systems are designed and controlled. Industry modeling and design software are used, and regulatory codes are covered.

**Prerequisite(s):** EENG4140

**EENG4250 | Senior Design Project II | Lecture (4 Credits)**

Execute project proposal from Senior Project I. Construct a working prototype. Display of project documentation. Present to a jury of peers, faculty and industry representatives.

**Prerequisite(s):** EENG4150

## Electronics Engineering Technology (ELTT)

**ELTT1100 | Basic Electricity & Electronics Lab | Laboratory (2 Credits)**

Analyze, design, and build series, parallel and combination AC and DC circuits. Build and test semiconductor circuits, power supplies, transistor circuits using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

**ELTT1110 | Basic Electricity & Electronics Lab | Laboratory (5 Credits)**

Analyze, design and build series, parallel and combination AC and DC circuits. Semiconductor circuits, power supplies, transistor circuits are built and tested using protoboards and various test equipment.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1120

**ELTT1120 | Basic Electricity & Electronics Theory | Lecture (8 Credits)**

Identification, recognition and calculations associated with basic electricity, including Ohm's Law, resistance, capacitance, inductance in AC and DC circuits, as well as solid state principles of diodes, power supplies and transistors.

**Prerequisite(s):** ELEC1111 And ELEC1112

**Corequisite(s):** ELTT1100 ELTT1110

**ELTT1200 | Digital & Microprocessors Lab | Laboratory (2 Credits)**

Design, build, and troubleshoot digital circuits. Debug and program microprocessors and microcontrollers for various operations and interface to external devices. Analyze digital and microprocessor circuits using industry standard test equipment.

**Prerequisite(s):** ELTT1100

**Corequisite(s):** ELTT1220

**ELTT1210 | Digital & Microprocessors Lab | Laboratory (3 Credits)**

Design, build, and troubleshoot digital circuits. Debug and program microprocessors and microcontrollers for various operations and interface to external devices. Analyze digital and microprocessor circuits using industry standard test equipment.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ELTT1220

**ELTT1220 | Digital & Microprocessors Theory | Lecture (8 Credits)**

Identification, recognition and calculations associated with combinational and sequential logic circuits as well as internal architecture of microprocessors and microcontrollers, programming, logic operations, memory mapping, addressing, data transfer, and system control.

**Prerequisite(s):** ELTT1120

**Corequisite(s):** ELTT1200 ELTT1210

**ELTT1230 | PCB & Circuit Development | Laboratory (1 Credit)**

Electronic circuit prototyping using various industry standards, hardware, and software. Utilize circuit manufacturing techniques to create surface mount and through hole circuit boards.

**Prerequisite(s):** ELTT1110

**ELTT1240 | Programming Fundamentals | Laboratory (1 Credit)**

Use algorithms and flowcharts to develop logic, execution control, data types, loops, and control structures for computer executable software. Utilizes National Instrument's LabVIEW.

**Prerequisite(s):** ELTT1110

**ELTT2200 | Advanced Electronics Lab | Laboratory (2 Credits)**

Design and build single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1110

**Corequisite(s):** ELTT2220 ELTT2230

**ELTT2210 | Advanced Electronics Lab | Laboratory (4 Credits)**

Design and build single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1210

**Corequisite(s):** ELTT2220 ELTT2221

**ELTT2211 | Advanced Electronics Lab | Laboratory (2 Credits)**

Design and build single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1210

**Corequisite(s):** ELTT2220 ELTT2221

**ELTT2220 | Advanced Electronics Theory | Lecture (6 Credits)**

Identification, recognition and calculations associated with single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1220

**Corequisite(s):** ELTT2200, ELTT2210, ELTT2211

**ELTT2221 | Advanced Electronics Theory | Lecture (5 Credits)**

Identification, recognition and calculations associated with single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits; other advanced electronics topics.

**Prerequisite(s):** ELTT1220

**Corequisite(s):** ELTT2210 ELTT2211

**ELTT2230 | Advanced Electronics Theory | Lecture (8 Credits)**

Identification, recognition and calculations associated with single and multistage transistor amplifiers, operation amplifier control circuits, thyristors, motors, radio frequency circuits as well as other advanced electronics topics.

**Prerequisite(s):** ELTT1220

**Corequisite(s):** ELTT2200

## Engineering Drafting & Design (MDES)

**MDES1110 | Engineering Drawings with SolidWorks | Lecture (4 Credits)**

Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

**MDES1210 | Process & Tool Design Lab | Laboratory (5 Credits)**

Distinguish modern manufacturing processes such as molding, welding, heat treating, and machining; identify typical materials, tools, and required equipment. Analysis of process-specific capabilities such as tolerance, surface finish, cost effectiveness, and geometry restrictions.

**Prerequisite(s):** MACH1110

**Corequisite(s):** MDES1230

**MDES1220 | Creo Parametric | Lecture (4 Credits)**

Create solid models, assemblies and engineering documentation using Creo Parametric. Apply fits and geometric dimensioning and tolerancing to models and drawings.

**Prerequisite(s):** MDES1110

**MDES1230 | Geometric Dimensioning & Tolerances | Lecture (4 Credits)**

Principles of geometric dimensioning and tolerancing in the context of engineering and manufacturing. Application of principles using coordinate measurement machines.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MDES1210

**MDES2110 | Product Design Lab | Laboratory (5 Credits)**

Introduction to product design methods and concepts; converting product ideas and requirements into working designs. Design balance and relation to concepts such as aesthetics, performance, ergonomics and manufacturability.

**Prerequisite(s):** MDES1210

**Corequisite(s):** MDES2120

**MDES2120 | Product Design Theory | Lecture (4 Credits)**

Integrate methods and concepts of product design to actual designs of simple products. Determine design parameters, develop product opinions, narrow the focus for balance, and document the final design.

**Prerequisite(s):** MDES1220

**Corequisite(s):** MDES2110

**MDES2130 | Advanced SolidWorks | Lecture (4 Credits)**

Simulation (Finite Element Analysis) and advanced surface modeling techniques. Culminates in testing for CSWA certification.

**Prerequisite(s):** MDES1110

**MDES2210 | Transmission of Power Lab | Laboratory (5 Credits)**

Design and draw projects with applications of gears, chains, bearings, cams, motors, clutches, cylinders, fluid and mechanical power transmission, robots and automation. Design resolution incorporating; project management, project selection, product design, calculations, design analysis, documentation, technical communications, quality and presentation.

**Prerequisite(s):** MDES2110

**Corequisite(s):** MDES2220

**MDES2220 | Transmission of Power Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with components of machines; mechanical and fluid power transmission, motors, clutches, gears, chains, bearings, cams, robots and automation. Design resolution incorporating; project management, project selection, product design, calculations, design analysis, documentation, technical communications, quality and presentation.

**Prerequisite(s):** MDES2120

**Corequisite(s):** MDES2210

**MDES2230 | Statics & Strength of Materials | Lecture (4 Credits)**

Fundamentals of statics and strength of materials. Development of techniques and mathematical methods used in design. Problem solving includes statics, direct stress, strength of materials, indirect stress, torsional stress and combined stress.

**Prerequisite(s):** MDES2130



## English (ENGL)

### ENGL1010 | English | Lecture (3 Credits)

Analyze the research and essay-writing process for purpose, planning, drafting, and revision. Explore writing patterns and thought development. Incorporate concepts of grammar and usage, documentation, source relevancy and credibility. Focus is on clear, concrete writing.

**General Education:** Communications

## Facilities Operations & Management (FOPS)

### FMGT1000 | Introduction to Facilities | Lecture (2 Credits)

Aspects of the facilities management industry are presented using interviews with practicing professionals, site tours, textbook studies and exploratory reflections to illustrate the many opportunities available as a professional.

### FMGT1100 | Building Operations | Lec/Lab (3 Credits)

Represent the organization's brand experience by providing various services for occupants. Interconnected systems and processes such as shipping and receiving, key management, property grounds, storage strategies, safety, housekeeping standards of care, food service, and waste management are paramount to meet the expectations of guests, tenants, owners, and users.

### FMGT1200 | MEP Systems: Electrical | Lec/Lab (3 Credits)

Explore electrical theories for a foundational understanding of how an electrical system interacts with a building. Laboratory exercises emphasize troubleshooting processes for electrical circuits and systems. Learn how a facilities team safely maintains and monitors a building's electrical system.

### FMGT1300 | Occupational Safety & Health | Lecture (2 Credits)

Examine the principles of facility safety and identify health hazards based on the Occupational Safety and Health Administration (OSHA) 1910 General Industry Standards and MN OSHA Laws and Rules. Emphasis is on hazard identification, avoidance, and control and prevention to develop strategies to prevent injuries to workers, occupants, and guests. Students successfully completing 30 hours of designated training topics receive an OSHA 30 General Industry card.

### FMGT1400 | Facility Programming & Design | Lec/Lab (3 Credits)

Techniques for analyzing design program requirements and optimizing space. Develop plans that satisfy programmatic needs and use space efficiently. Examine building codes, fire safety, and barrier-free designs as essential components of laying out a workable interior space. Practice basic drafting techniques on current industry software.

### FMGT1700 | Special Engineer License Prep | Seminar (1 Credit)

Prepare to pass the Minnesota Special Engineer's license exam.

Introduction to both high and low pressure boilers used in steam and hot water heating, high-pressure, high temperature hot water boilers used in heating or process installations, and small mechanical-drive steam turbines. Topics include boiler functions, operations, safety, controls, hot water systems, steam systems, and the identification of boiler fittings. MN Statute 326B.972 requires an individual operating a boiler, steam engine, or steam turbine to hold a license for the grade covering that boiler, steam engine, or steam turbine. Also, preparation for the EPA's Section 608 Technician Certification allowing them to work with and handle refrigerants in common air conditioners and HVAC units. The EPA 608 Technician Certification is required by Section 608 of the Federal Clean Air Act for anyone who maintains, services, repairs, or disposes of equipment that could release ozone depleting refrigerants into the atmosphere.

### FMGT2010 | Second Class Engineer License Prep | Seminar (1 Credit)

Prepare to pass the Minnesota Second Class Engineer license exam.

Review of low pressure boilers used in steam and hot water heating. Topics include MN license requirements, inspections, documentation, boiler functions, operations, safety, controls, feedwater systems, and the identification of boiler fittings. MN Statute 326B.972 requires an individual operating a boiler, steam engine, or steam turbine to hold a license for the grade covering that boiler, steam engine, or steam turbine. Students must have 1 year of licensed experience to sit for the exam.

### FMGT2011 | Facility Operations & Management Topics | Seminar (1 Credit)

Presentation and examination of topics in facilities operations and management selected to develop a deeper awareness of current trends, issues, and emerging technologies. Supplemented by readings, discussions and papers.

### FMGT2100 | Property Maintenance | Lec/Lab (3 Credits)

Best practices for efficient and effective triage of maintenance and other occupant requests through work orders. Planning for prescriptive and predictive maintenance of systems. Sustainable solutions and asset management. Laboratory exercises emphasize using and managing related tools and resources for various assets and systems.

### FMGT2110 | MEP Systems: HVAC&R | Lec/Lab (3 Credits)

Explore mechanical theories for a foundational understanding of heating, ventilating, air conditioning and refrigeration systems. Learn the role of HVAC systems in various types of buildings and the key characteristics that enable effective HVAC system functionality. Laboratory experiments and exercises emphasize troubleshooting processes for HVAC&R systems. Learn how a facilities technician safely maintains a building's HVAC&R equipment and components and monitors the system.

**Prerequisite(s):** FMGT1200

### FMGT2200 | Facility Operations/Management Capstone | Capstone (3 Credits)

Apply facilities management theories, topics, and applications to a final project. Work consists of a project proposal, development of coordinating documents, and final presentation.

**Prerequisite(s):** COMM1030



**FMGT2210 | Smart Buildings I | Lec/Lab (3 Credits)**

Explore how we advance the productivity and safety of occupants while improving the operational efficiency of buildings through intelligent, integrated green building technologies. Introduction to a number of systems associated with building automation, energy management, and connectivity to global systems. Laboratory exercises focus on building management systems and interconnected components. Emphasis is on sustainable outcomes by decreasing the carbon footprint of a building.

**Prerequisite(s):** FMGT1200 And FMGT2110

## General Science (GSCI)

**GSCI1080 | Environmental Science | Lecture (3 Credits)**

Scientific principles, concepts and methodologies required to understand the interrelationships of the natural world.

**General Education:** Natural Sciences

**GSCI1081 | Environmental Science with Lab | Lec/Lab (3 Credits)**

Scientific principles, concepts and methodologies required to understand the interrelationships of the natural world. Labs included.

**General Education:** Physical Sciences with Lab

**GSCI1090 | Current Events in Science | Lecture (3 Credits)**

Analyze and evaluate the current science findings and their global effects.

**General Education:** Natural Sciences

**GSCI1095 | How Science Explores the Natural World | Lecture (3 Credits)**

Explore science as a process rather than a set of topics. Analyze studies of natural phenomena and determine how they align to the scientific method and how they deviate from it. Rate them based on their adherence to scientific practice. Distinguish what is science from what is not.

**General Education:** Natural Sciences

**GSCI1200 | General Science | Lecture (2 Credits)**

Introduction to fundamental scientific concepts, principles, processes, and phenomenon, and how they impact society.

**General Education:** Natural Sciences

**GSCI1910 | General Science Topics I | Lecture (1 Credit)**

Topics in general science selected by faculty assigned to the course.

**General Education:** Natural Sciences

**GSCI1920 | General Science Topics II | Lecture (2 Credits)**

Topics in general science selected by faculty assigned to the course.

**General Education:** Natural Sciences

**GSCI3000 | Applied Environmental Science with Lab | Lec/Lab (3 Credits)**

The practical application of scientific principles as they relate to environmental health and sustainability. Labs included.

**General Education:** Physical Sciences with Lab

## Geography (GEOG)

**GEOG1000 | World Geography | Lecture (3 Credits)**

Explore the world through the fascinating cultures, architecture, traditions, politics, people and urban settings of vastly different countries. Examine urban geography in terms of concentration, infrastructure, economy, and environmental impacts.

**General Education:** Social Sciences

## Graphic Design (GDES)

**GDES1210 | Typography | Lec/Lab (2 Credits)**

Examine typographic principles with an overview of the history of type. Identify typographic vocabulary, and explain the use of typography as a tool to enhance visual interest and communication.

**Prerequisite(s):** GAPT1110

**GDES1220 | Design for Print | Lec/Lab (2 Credits)**

Practice of basic design principles applied to projects destined for traditional print media. Create various print projects from concept, brand development and design asset coordination to print ready files. Demonstrate critical design analysis through classroom critiques.

**Prerequisite(s):** GAPT1110

**GDES1231 | Vector Design | Laboratory (1 Credit)**

Introduction to two-dimensional design through a study of principles and elements of design. Explore these principles and elements using Adobe Illustrator.

**Prerequisite(s):** GAPT1110 And GAPT1120

**GDES2110 | Design for Digital Print | Lec/Lab (2 Credits)**

Principles of design for contemporary digital output devices and the special design considerations required. Introduction to opportunities unique to digital output including wide format, short run printing and variable data output.

**Prerequisite(s):** GDES1210 And GDES1220

**GDES2120 | Design for Publication | Lec/Lab (2 Credits)**

Investigation and design of structural systems and organizational methods for multi-page documents, such as newsletters, magazines, books and catalogs. Cross-media publication processes will also be explored.

**Prerequisite(s):** GDES1210 And GDES1220

**GDES2140 | Design for Animation & Interactivity | Lec/Lab (2 Credits)**

Introduction to the concepts and tools used for creating time and motion based design including documents that involve user interaction. Students will create 2-D animations from storyboarding to finished stand alone or web-based projects.

**Prerequisite(s):** GAPT1110 And GDES1231

**GDES2210 | Business of Design | Lec/Lab (2 Credits)**

Basics of marketing, proposals, legal considerations, and working with clients; an overview of potential career paths for designers. Develop individual professional brand marks and identity system.

**GDES2220 | Information Design | Lec/Lab (2 Credits)**

A combination of theory and practice covering principles of design, perception and usability; demonstrate how graphic design can positively affect the presentation of information.

**Prerequisite(s):** GDES1210

**GDES2230 | Graphic Design Portfolio | Studio (1 Credit)**

Planning and preparation of both an analog and digital presentation of student design work as evidence of graphic design skills and abilities. Focus on selection, organization and presentation for professional advancement.

**Prerequisite(s):** GDES2120 And GDES2220

**GDES2240 | Graphic Design Capstone | Capstone (4 Credits)**

Applying and developing technical skills and professional behavior for graphic designers; a closely supervised, project-based experience.

**Prerequisite(s):** GDES2120 And GDES2220

**GDES2241 | Graphic Design Capstone | Capstone (2 Credits)**

A closely supervised, project based experience. Apply and develop technical skills and professional behavior for graphic designers.

**Prerequisite(s):** GDES2120 And GDES2220

**GDES2243 | Graphic Design Capstone | Capstone (3 Credits)**

Apply and develop technical skills and professional behavior for graphic designers; a closely supervised, project based experience.

**Prerequisite(s):** GDES2120 And GDES2220

## Graphics & Printing Technologies (GAPT)

**GAPT1110 | Design Principles & Applications | Lec/Lab (3 Credits)**

Introduction to design principles and processes, including creative problem solving, design work flows, and industry best practices; includes typography, drawing, layout and composition. Explore Adobe Creative Suite.

**GAPT1120 | Pre-Media Principles & Applications | Lec/Lab (3 Credits)**

Introduction to pre-media principles and processes. Input, edit, output and archive media assets for all possible print and online outcomes. Explore various pre-media workflows, using industry best practices.

**GAPT1130 | 21st Century Graphic Communication | Lec/Lab (3 Credits)**

Introduction to digital and analog print processes, and various bindery and finishing technologies. Prepare and test for Flexographic Technical Association Level One Certification.

**GAPT1141 | Introduction to Web Design | Laboratory (1 Credit)**

Introduction to web design using a graphical user interface web development tool. Basics of HTML and CSS with an emphasis on web design principles and file management.

**GAPT1150 | Introduction to Color Theory | Lecture (1 Credit)**

The importance and power of color in graphic communication, brand identity, and color reproduction. Color psychology, science and applications. Hands-on exploration of RGB, LAB and CMYK color spaces.

**GAPT1210 | Packaging Design | Lec/Lab (2 Credits)**

Investigate the concepts of folding carton design and production for retail and commercial use. Client-driven creation of a custom folding carton from structural design through finished branded prototype and formal presentation. Train on industry standard ArtiosCAD and Studio Visualizer software to produce virtual 3D animations and physical mock-ups.

**GAPT1220 | Applied Color Theory | Laboratory (1 Credit)**

Practice the use of color from design through output. Color palettes, color matching systems, process and custom inks, color separating, color measurement, color indexing, introduction to color management.

**Prerequisite(s):** GAPT1150

**GAPT1230 | Image Composition & Effects | Laboratory (1 Credit)**

Investigate Photoshop core competencies for designers and pre-media technicians related to image editing and compositing. Practice masking, layer organization and blending, basic color correction, vector/raster collage work, subject silhouetting, and creating shadows and reflections.

**Prerequisite(s):** GAPT1120

**GAPT2110 | Color Management | Lec/Lab (2 Credits)**

Cross-disciplinary course uniting design, pre-media and press students for the practical application of color managed work flows. Calibration, characterization, and conversion best practices. Team based creation and production of related color print samples managed across multiple devices.

**Prerequisite(s):** GAPT1220

**GAPT2120 | Web Graphics | Lec/Lab (2 Credits)**

Introduction to web design from creating wire frames to finished mockups. Emphasis is on web page layout and the creation and formatting of the graphic elements on a web page.

**Prerequisite(s):** CWEB1000, Or CWEB1010, Or CDEV1010

**GAPT2230 | Business of Print | Lecture (1 Credit)**

The basics of print business operations, including profit and loss, equipment costs, rates and shift considerations, wages and benefits, and domestic versus offshore production. Other related topics include lean manufacturing and six sigma principles, as well as emerging shifts toward consultative practices, marketing and brand management, as practiced in the packaging and digital printing industries.

**GAPT2240 | Graphic Arts Industry Internship | Internship (4 Credits)**

Applying and developing technical skills and professional behavior; monitored on-the-job work experience.

**GAPT2241 | Graphic Arts Industry Internship | Internship (2 Credits)**

Monitored on the job work experience. Apply and develop technical skills and professional behavior.

**GAPT2243 | Graphic Arts Industry Internship | Internship (3 Credits)**

Apply and develop technical skills and professional behavior; monitored on-the-job work experience.

## Heating & A/C Engineering Technology (HASD)

**HASD1110 | Refrigeration & Air Conditioning Systems | Lec/Lab (3 Credits)**

Introduction to the mechanical refrigeration cycle and related HVAC equipment, includes the cyclic nature of the refrigeration systems, individual components and the correlation of service practice and integration of controls. Explore servicing mechanical refrigeration equipment, components of the system, and basic systematic servicing techniques.

**HASD1120 | Electrical Principles for HVAC | Lec/Lab (3 Credits)**

Basic electrical terminology and theory. Introduction to simple-circuit construction. Basic electrical properties and their effects on circuits. Simple-circuit diagramming and the theory of electrical generation through magnetism and electromagnetism. Analyze and test circuits with various test equipment. Examine the principles, applications, and wiring of series, parallel and series-parallel circuits.

**Prerequisite(s):** HASD1110

**HASD1130 | Heating & Environmental Systems | Lec/Lab (3 Credits)**

Heat generation as it pertains to residential furnaces. Topics include: principles of Natural and LP gases, furnace types, sequence of operation, component identification, ignition types, test equipment and safety. Perform troubleshooting of the mechanical operation and the electrical control functions of gas furnaces, incorporating wiring diagrams and schematics. Introduction to sequence of operation for oil-burning and forced-air electric furnaces.

**Prerequisite(s):** HASD1120

**HASD1140 | HVAC Installation & Duct Fabrication | Lec/Lab (2 Credits)**

Proper installation techniques for HVAC equipment and related materials, such as diffusers, dampers, flex connectors, grilles, plenums and ducts. Fabricate ductwork and fittings common to the HVAC industry; trunk-line fabrication with emphasis on quality and quantity of work.

**Prerequisite(s):** HASD1130

**HASD1150 | HVAC Ducted Systems, Testing & Balancing | Lec/Lab (2 Credits)**

Principles of sizing duct systems, grilles, registers and related equipment for residential and commercial applications. Theory and practice of testing, adjusting, and balancing HVAC systems to specific thermal loads.  
**Prerequisite(s):** HASD1140

**HASD1210 | Building Sciences & Construction Methods | Lec/Lab (4 Credits)**

Laws of thermodynamics with major emphasis on environmental control. Apply thermodynamic principles to air-conditioning processes. Fundamental theory of the design and layout of residential and light commercial HVAC systems. Produce sketches of working mechanical drawings; analyze friction and dynamic losses within HVAC systems utilizing fitting loss coefficients and duct-sizing methods.

**HASD1220 | Designing for Indoor Comfort | Lec/Lab (3 Credits)**

Step-by-step procedures for industry-based energy calculations, including load profiles, equipment modeling, performance, and control modeling to ensure maximum energy efficiencies. Thermal performances of exterior envelopes with varying parameters, including above- and below-grade earth-bermed, earth-sheltered and on-grade constructions. Apply industry-based energy calculations of various constructions; related computer programs, including load estimating, operating cost analysis, and equipment selection.

**Prerequisite(s):** HASD1210

**HASD1230 | Radiant Systems Design | Lec/Lab (3 Credits)**

Principles of design and layout of residential and light commercial hydronic heating systems with emphasis on hydronic equipment, location, and selection. Coordinate hydronic systems with architectural, structural, electrical, and civil disciplines. Examine zone controls and wiring of hydronic systems.

**Prerequisite(s):** HASD1220

**HASD1240 | HVAC Layout and Systems Design | Lec/Lab (3 Credits)**

Principles of design and layout of residential and light commercial HVAC systems with emphasis on HVAC equipment, location, and selection. Coordinate HVAC systems with architectural and electrical disciplines. Examine national and local code compliances for HVAC systems. Explore energy conserving practices.

**Prerequisite(s):** HASD1230

**HASD2110 | Commercial Heating & Piping Systems | Lec/Lab (8 Credits)**

Principles of design, layout and energy analysis of commercial building piping systems in conjunction with local and state codes. Development of working drawings reflecting coordination of plumbing, hot water and steam heating systems with architectural, electrical and civil disciplines. Procedures for calculating commercial space design heating and cooling loads manually and with the use of computer software programs. Examination of individual heating and cooling load sources including roofs, walls, glass, air infiltration, partitions, lights, people and space equipment. Calculations of how different building components and various sources of energy affect total building energy use.

**Prerequisite(s):** HASD1240

**HASD2120 | Packaged Air Conditioning Systems Design | Lec/Lab (5 Credits)**

Developing requirements for selection, layout, design and drafting of various packaged heating and cooling equipment for commercial buildings. Operating characteristics of packaged air systems. Outdoor air ventilation requirements and calculations. Characteristics of air (psychrometrics) used in heating, cooling, humidification and dehumidification processes. Procedures to determine the packaged equipment cooling coil and heating capacities. Air distribution methods for designing, laying out and sizing supply, return and exhaust ductwork. Calculation of air flow resistance in duct systems. Analysis of building air balance.

**Prerequisite(s):** HASD2110

**HASD2210 | Geothermal & Heat Pump Systems Design | Lec/Lab (5 Credits)**

Developing requirements for selection, layout, design and drafting of geothermal (ground source/water source) and air to air heat pump equipment for commercial buildings. Operating characteristics of heat pump systems. Analysis of exhaust and ventilation requirements for special space applications. Commercial building life safety systems. Smoke and fire control in duct systems and fire protection sprinkling systems. Proper application considerations. Costs, advantages and disadvantages of equipment selections and specific requirements to design for the best energy efficiency.

**Prerequisite(s):** HASD2120

**HASD2220 | HVAC Systems Integration & Controls | Lec/Lab (8 Credits)**

Preparation of working construction documents of large split system HVAC piping and variable air volume systems for commercial buildings. Alternate air handling and ventilation systems that use less energy and provide higher indoor air quality. Use of Building Information Modeling (BIM) to analyze how HVAC requirements can be integrated to work with architectural, structural, electrical, interiors and civil disciplines. Pneumatic, electric and electronic HVAC controls used in commercial air handling and piping systems. Control sequences analyzed and validated to meet specific building needs. Identify the building mechanical systems concerns and problems; select the best possible alternative as the final solution.

**Prerequisite(s):** HASD2210

## Honda Professional Auto Career Training (PACT)

**PACT1210 | Dealer Service Systems | Lec/Lab (3 Credits)**

Introduction to dealership systems: repair order writing, dealership management training, and Honda Interactive Networking systems. Emphasis will be on vehicle inspection techniques; utilization of Honda scan tools in troubleshooting advanced computer controlled vehicles.

**Prerequisite(s):** PACT1210

**PACT1220 | Body Electrical Systems | Lec/Lab (4 Credits)**

Theory of operation and diagnostic principles of Honda/Acura chassis and body electrical systems. On-vehicle component testing with the latest scan tools, digital multi-meters, lab scopes, and factory electrical schematics.

**Prerequisite(s):** PACT1210

**PACT1230 | Advanced Brakes & Suspension Systems | Lec/Lab (3 Credits)**

Theory of operation and diagnostic principles of Honda/Acura brake/suspension systems. ABS (Anti-lock braking system), traction control systems, advanced steering stability systems, pre-alignment inspections. 4-wheel alignment, suspension & steering systems, component repair and replacement, troubleshooting vibration, noise, and harshness concerns.

**Prerequisite(s):** PACT1210 And PACT1220

**PACT2110 | Drivetrain Systems | Lec/Lab (7 Credits)**

Theory of operation and diagnostic principles of Honda/Acura drivetrain systems. Differentials, CV and universal joints, manual transmissions, transfer cases, automatic transmissions. System maintenance, periodic service, and on-vehicle diagnosis. Disassembly, inspection, and assembly of system components. CVT transmission and hybrid transmission.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

**PACT2120 | Heating & Air Conditioning | Lec/Lab (2 Credits)**

Theory of operation and diagnostic principles of Honda/Acura air conditioning and heating systems. Refrigeration system service, control system repair, heater service, automatic heating/AC systems, component testing, environmental issues, and troubleshooting the various systems.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

**PACT2131 | PACT Internship 1 | Internship (4 Credits)**

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

**PACT2210 | Engine Diagnostics & Repair | Lec/Lab (3 Credits)**

Hands-on repair of the Honda/Acura Engines. Service procedures include cooling system repair, lubrication system repair, intake systems repair, exhaust repair, engine testing, engine replacement, engine disassembly, cleaning and measurement, cylinder head diagnostics, timing belt/chain replacement 4cyl, 6cyl, 8cyl.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

**PACT2220 | Engine Performance Repair | Lec/Lab (6 Credits)**

Hands-on repair of the Honda/Acura fuel and computerized engine control systems. Service procedures include: fuel pressure testing, fuel injector testing, exhaust gas analysis, advanced scan tool usage, and on-vehicle diagnostics. Advanced diagnostics, including hands-on repair of the Honda/Acura engine control systems. Service procedures include: on-vehicle diagnostics of Honda/Acura including advanced computer control systems, networking communication, emission control systems, and test drive diagnostic techniques.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

**PACT2231 | PACT Internship II | Internship (4 Credits)**

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** PACT1210, PACT1220, And PACT1230

## Humanities (HUMN)

**HUMN1910 | Humanities Topics I | Lecture (1 Credit)**

Humanities Topics I focuses on topics in humanities selected by faculty assigned to the course.

**General Education:** Humanities

**HUMN1920 | Humanities Topics II | Lecture (2 Credits)**

Focus is on topics in humanities selected by faculty assigned to the course.

**General Education:** Humanities

**HUMN2100 | The Literature of Migration | Lecture (3 Credits)**

Examine the literature and films inspired by the immigrant, refugee, and foreigner experience here in America and abroad. Explore the different ways one can become a foreigner and how art can be used as a means of immersing the reader/viewer in the foreigner experience.

**General Education:** Humanities

**HUMN2400 | Ethics | Lecture (2 Credits)**

The development of ethical standards as related to the individual, government, business, and society. Current legislation is examined from the perspective of its moral and ethical roots with considerations and standards influencing personal and business decisions.

**General Education:** Diversity

**HUMN3000 | Human Creative Expression | Lecture (2 Credits)**

Exploration of human values, attitudes and ideas by examining humankind's historical cultural achievements from a variety of time periods, art forms, creators and cultural traditions to develop an appreciation of the interrelated expressions of human culture.

**General Education:** Upper Humanities

**HUMN3600 | Critical & Creative Thinking | Lecture (3 Credits)**

Explore how critical thinking and creativity intersect through various theories to solve diverse, complex or abstract problems.

**General Education:** Upper Humanities

**HUMN3910 | Arts & Humn Topics I | Lecture (1 Credit)**

Topics in arts & humanities selected by faculty assigned to the course.

**General Education:** Upper Humanities

**HUMN4000 | Ethical Decision-Making | Lecture (2 Credits)**

Examine major moral theories of right and wrong, such as utilitarianism, deontology, egoism, virtue ethics, and feminism. Apply these theories in sound, ethical decision-making particularly in one's professional life. Through case studies, the consequences of a decision in terms of responsibilities to the company and the economy, to the people impacted by the decision, and to the environment at large are weighed. Explore the tension often created by the difference between what is morally right and what the company's code of ethics states or what the society's laws require.

**General Education:** Upper Humanities

## HVAC Installation & Residential Service (HEAT)

**HEAT1110 | HVAC Ducts & Fittings | Lec/Lab (2 Credits)**

Development and fabrication of ducts and fittings common to the heating, ventilation, and air conditioning industry, with emphasis on uniform and state code requirements. Methods of connecting ducts and fittings in an air system. Principles of geometric pattern development as it applies to duct construction and application. Multiple uses and care of hand tools common to the industry.

**HEAT1120 | Transitional Fittings | Lec/Lab (3 Credits)**

Focus on transitional fittings where the triangulation method of pattern development is required. Use of direct triangulation, as a short-cut method of layout, is emphasized. Identification, care, adjustment, and maintenance of floor equipment common to the sheet metal industry.

**Prerequisite(s):** HEAT1110

**HEAT1130 | HVAC Trunk-line Construction | Lec/Lab (2 Credits)**

Pattern development, and the fabrication of a scaled-down trunk-line, emphasizing the quality and quantity of work. Usage, construction methods, and installation of various types of dampers.

**Prerequisite(s):** HEAT1110 And HEAT1120



**HEAT1140 | Fundamentals of Pattern Development | Lec/Lab (3 Credits)**

Principles of pattern development as they apply to the layout of round fittings requiring parallel, or radial line methods of pattern development. Fabrication procedures for round fittings, including use of rotary machines for fabricating purposes, riveting, and spot welding. Use, safety, and proper procedures for soldering sheet metal are incorporated.

**Prerequisite(s):** HEAT1110, HEAT1120, And HEAT1130

**HEAT1150 | Advanced Pattern Development | Lec/Lab (3 Credits)**

Advanced theory and application of single, and double-line triangulation in the development of irregular patterns. Use of plan and elevation views in the visualization, and development of irregular objects as well as the procedure for the development of true-length lines seen in the foreshortened mode.

**Prerequisite(s):** HEAT1110, HEAT1120, HEAT1130, And HEAT1140

**HEAT2210 | Welding Fundamentals | Lec/Lab (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Vulcan software for CNC plasma table controllers.

**HEAT2220 | HVAC Design | Lec/Lab (2 Credits)**

Heat loss and heat gain energy calculation based upon Manual J: Calculation. Development of the requirements for selecting and designing heating and cooling systems for residential construction. Operating characteristics, proper application, cost, advantages/disadvantages, and specific requirements for designing systems to meet specific needs.

**HEAT2230 | Residential HVAC Installation | Lec/Lab (6 Credits)**

Installation procedures of residential and small commercial heating, ventilation, and air conditioning systems. Emphasis on the Uniform Mechanical code, and Minnesota State Mechanical, Fuel Gas, and Plumbing code, pertaining to heating, ventilation, and air conditioning installation procedures. Air-handling ducts, venting, combustion and fresh-air ducts requirements. Use of available standard-type fittings; sizing, cutting, and threading of gas pipe as well as installation and code requirement of residential-style gas systems. Installation, setup, and maintenance, of industries most common indoor air quality accessories is included.

**Prerequisite(s):** HEAT2210, HEAT2220, HEAT1110, HEAT1120, HEAT1130, HEAT1140, And HEAT1150

**HEAT2240 | Commercial Blueprint Reading | Lec/Lab (2 Credits)**

Architectural, structural, civil, electrical and mechanical blueprint reading with a major emphasis on heating, ventilation, and air conditioning systems contained within these plans. Duct construction, hangers and dampers evaluated according to specification and SMACNA requirements. Make drawings using AutoCAD: 2-D drafting commands for HVAC drafting.

## HVACR Systems Servicing (SERV)

**SERV1110 | HVAC Electrical I | Lec/Lab (2 Credits)**

Basic electrical terminology and theory. Introduction to simple circuit construction. Basic electrical properties and their effects on circuits. Load capacity for wiring and fuses. Simple circuit diagramming. Theory of electrical generation through magnetism and electromagnetism. Analyzing and testing circuits with various test equipment.

**SERV1120 | Heating Systems I | Lec/Lab (3 Credits)**

Basic fundamentals and terminology pertaining to heat transfer. Thermal environmental science properties. Latent and sensible heat, conduction, convection and radiation. Fundamental psychrometrics. Air distribution, room air movement characteristics and the fundamentals of balancing air systems. Analyzing static, velocity and total pressure along with airflow measurements within ductwork.

**SERV1130 | Residential Controls I | Lec/Lab (2 Credits)**

Introduction to basic environmental controls with an emphasis on theory, application, and practical installation. Principles of Effective Temperature will be applied to various temperature, humidity, and air movement controls. Basic control of secondary circuits including transformers, relays, and contactors used in the operation of heating and cooling equipment. Sketch, diagram, and wire basic secondary control circuits. Job safety.

**Prerequisite(s):** SERV1110

**SERV1140 | Basic Motor Technology | Lec/Lab (3 Credits)**

Theory of magnetism and circuitry as it pertains to the induction motor. Introduction to fundamental types of motors used in the HVAC field. Wiring of various power and control circuits. Introduction to the relay, contactor and motor starter. Motor usage and service problems encountered in the field. Electrical diagramming and schematics. Troubleshooting motor circuits. Motor nomenclature and safety.

**Prerequisite(s):** SERV1110

**SERV1150 | Cooling Systems I | Lec/Lab (3 Credits)**

Basic fundamentals of cooling as it pertains to HVAC&R systems. Gas laws and the principles of the basic refrigeration cycle. Skills pertaining to refrigeration: tubing handling, flaring, swedging, soft and hard soldering and brazing. Introduction to refrigerants and refrigerant management.

**Prerequisite(s):** SERV1120

**SERV1210 | Heating Systems II | Lec/Lab (3 Credits)**

Heat generation as it pertains to residential furnaces. Natural and LP gases. Furnace types, sequence of operation, component identification, ignition types, test equipment and safety. Troubleshooting pertaining to the mechanical operation and the electrical control functions of gas furnaces. Diagnostic skills to meet service problems encountered in the field. Combustion testing and job safety.

**Prerequisite(s):** SERV1110, SERV1130, And SERV1140

**SERV1220 | Cooling Systems II | Lec/Lab (3 Credits)**

Fundamentals of residential air conditioning. Evacuation principles and procedures for deep vacuums. Basic split system air conditioning systems wiring and controls examined and diagrammed in schematics. Refrigerant chemistry examined. Refrigerant recycling, recovery, and management reviewed in accordance with EPA standards. Systematic refrigerant charging procedures determined and validated through hands-on guidance using actual equipment. Basic cooling analysis through psychrometrics and pressure-enthalpy processes. Job safety.

**Prerequisite(s):** SERV1110, SERV1130, SERV1140, And SERV1150

**SERV1230 | HVAC Electrical II | Lec/Lab (2 Credits)**

Introduction to semiconductors and elementary solid-state circuits used in HVACR control circuits. Electrical schematics for HVACR secondary and load circuitry. Fundamental operation and wiring of motor starter secondary and load circuits examined, diagrammed, and wired. Electronic theory applied to electronic air cleaners, electronically commutated motors, and digital temperature controls. Continued application of relays, and contactors developed in lab jobs and servicing situations encountered in the field. Job safety.

**Prerequisite(s):** SERV1110



**SERV1240 | Heating Systems III | Lec/Lab (2 Credits)**

Introduction to forced air, oil burning, and electric furnaces. Evaluation of gas, oil, and electric furnace sequences of operation coupled with combustion analysis. Practice of start up procedures and combustion testing processes. Mechanical and electrical applications using wiring diagrams and schematics. Diagnostic skills of mechanical, combustion, and electrical problems encountered in the field. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1210, And SERV1230

**SERV1250 | Cooling Systems III | Lec/Lab (3 Credits)**

Advanced residential air conditioning and air-to-air heat pump systems. Theory and troubleshooting of heat pumps. Application and operation of air conditioning and heat pump controls examined. Wiring diagrams and schematics examined and evaluated. EPA and R-410a certification test review and exam. Introduction to customer relations skills with a focus on occupational professionalism. Job safety.

**Prerequisite(s):** SERV1110, SERV1120, SERV1130, SERV1140, SERV1220, And SERV1230

**SERV2110 | Domestic Refrigeration Service | Lec/Lab (2 Credits)**

The mechanical refrigeration cycle of domestic refrigeration equipment will be analyzed and serviced to provide optimum operation. Refrigeration system component installation, analysis, check-out, repairs and maintenance. System start-up. Internal and external control troubleshooting and analyzing. Operations of various control systems utilized in high temperature refrigeration. Job safety.

**Prerequisite(s):** SERV1240 And SERV1250

**SERV2120 | Commercial Refrigeration Service I | Lec/Lab (6 Credits)**

Air-cooled and water-cooled refrigeration systems. System component analysis, repair and replacement. Methods of defrost, system start up; internal and external control troubleshooting and analyzing; electrical and electronic-control systems. Mechanical refrigeration cycle troubleshooting. Job safety.

**Prerequisite(s):** SERV2110

**SERV2130 | Commercial Refrigeration Service II | Lec/Lab (2 Credits)**

Process chilled water and supermarket systems control, operation and energy management. Safety, both personal and equipment. Daily operation and preventive maintenance. Hands-on analysis and replacement of refrigeration system components. Analyze refrigeration controls. Screw and centrifugal chiller operation leading to year-round system operation.

**Prerequisite(s):** SERV2120

**SERV2140 | HVAC Control Concepts | Lec/Lab (3 Credits)**

Fundamentals of HVAC control. Formations including pneumatic, electric, electronic, DDC and building energy management systems as they pertain to troubleshooting. Application of control systems of individual room, zone air distribution, variable frequency drives, air handlers, chillers and boilers. Damper control including economizer cycles in conjunction with indoor air quality. Safety, both personal and equipment.

**Prerequisite(s):** SERV2130

**SERV2210 | HVAC Systems Servicing I | Lec/Lab (3 Credits)**

Energy management systems. Interfacing HVAC air handlers with energy sources in heating and cooling modes. Psychrometrics, start up and operation of industrial burners and their controls. System fail safe parameters. Analyzing outdoor air control parameters coordinating between energy efficiencies and desirable indoor air qualities. Make up and exhaust systems. DX and chilled water systems and component operation check out, analysis, repair and replacement. Control modes of various HVAC functions. System start up and check out procedures. Gas and mechanical codes. Safety, both personal and equipment.

**Prerequisite(s):** SERV1240 And SERV1250

**SERV2230 | Building Systems Operations I | Lec/Lab (2 Credits)**

Layout and construction of common sheet metal components found in building HVAC&R systems. Retrofitting skills with a working knowledge of the Uniform Mechanical Code. Welding skills with a focus on oxyacetylene. Safety issues emphasized.

**Prerequisite(s):** SERV2220

**SERV2231 | Welding Fundamentals & Sheet Metal | Lec/Lab (3 Credits)**

Applications, safety, and procedures for oxyacetylene, stick, GMAW, and TIG welding. Light and heavy-metal welding in flat position, freehand-cutting procedures, types of weld joints, and joint preparation. Fabrication of ductwork and fittings common to the HVAC industry; emphasis on SMACNA and ASHRAE standards.

**SERV2240 | HVAC Systems Servicing III | Lec/Lab (3 Credits)**

Steam accessories and codes regulating them, with emphasis on the Minnesota Boiler Examination. Hands-on analyzing control systems serving these HVAC systems. Steam systems and components. Constant volume HVAC systems. Blowers, filters, cooling coils, heating coils, air blenders and mixing boxes. Energy management systems. Individual HVAC components sized and selected along with single line designs of constant volume and multi zone systems. Low and high pressure steam, boilers and their systems. Steam/hot water fan coil units. Safety, both personal and equipment.

**Prerequisite(s):** SERV2230

**SERV2250 | Building Systems Operations II | Lec/Lab (2 Credits)**

Start up, check out, troubleshoot, diagnose, repair and replace various HVAC wet and dry systems and components. Roof top unit (RTU) start up and check out. Final check outs of various systems used in commercial installations. Operational reports. Control systems. Energy management systems. Preventive maintenance schedules of HVAC equipment. Plumbing, fire-protection and snow melting systems analyzed. Safety, both personal and equipment.

**Prerequisite(s):** SERV2240

## Industrial Engineering Technology (IENG)

**IENG1120 | Introduction to Engineering | Lecture (2 Credits)**

Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

**IENG1910 | Engineering Topics I | Directed Study (1 Credit)**

Engineering Topics I focuses on topics in engineering selected by faculty assigned to the course.

**IENG3115 | Statistical Quality Control | Lecture (2 Credits)**

Apply statistical methods to study the quality of products and services, determining how to reduce the time required to produce the product and ensure the quality of the product. Topics include probability and statistics, control charts, acceptance criteria and sampling, and case studies.

**IENG3120 | Introduction to Engineering | Lecture (2 Credits)**

Explore major topics in Engineering, such as time management, industry software, study skills, internship availability and career opportunities. A professional portfolio will be started in this course and reviewed each semester.

**IENG3145 | Ethics & Social Responsibility for Eng | Lecture (2 Credits)**

The theory and application of ethics and social responsibility as it applies to engineering practice. Topics include engineering ethics codes, cultural and diversity issues, environmental concerns, and intellectual property.

**IENG3150 | Manufacturing Processes with Lab | Lec/Lab (3 Credits)**

Examine and apply various manufacturing processes and materials used in product development and manufacturing. Each process is covered from a technical perspective, with an emphasis placed on how multiple processes can be linked together. Several manufacturing processes, such as computer aided design, machining, welding, and electronics are used to design a product.

**IENG3215 | Project Management | Lecture (2 Credits)**

Examine the methods and tools used for effective management of engineering projects. Topics include the analytical methods used to budget, schedule, and control projects, as well as risk management, team leadership, and communication.

**IENG3235 | Quality Systems | Lecture (2 Credits)**

Investigate several quality concepts used to improve quality and customer satisfaction. Topics include principle concepts of quality management: customer, process, and workforce focuses; international standards; concurrent engineering; and performance for excellence, strategy, and knowledge management.

**Prerequisite(s):** IENG3115

**IENG3250 | Lean Systems with Lab | Lec/Lab (3 Credits)**

Investigate the history and evolution of lean systems and current day applications to manufacturing, service, and business. Apply fundamental lean philosophies and tools to manufacturing, service, and business. Understand the role of culture transformation and change management techniques in the application of lean tools.

**IENG4111 | Ergonomics & Work Measurement | Lecture (3 Credits)**

Introduction to ergonomics as applied to the human-machine interface, as well as the fundamental concepts behind work design, with emphasis on measuring work and analyzing work methods. Topics include methods engineering and analysis, time and motion studies, and workplace design considering physical and cognitive ergonomic principles.

**IENG4115 | Supply Chain Management | Lecture (2 Credits)**

Explain the fundamentals of supply chain management. Topics include the supply chain network, system integration, supply chain strategies, and challenges in managing the supply chain.

**IENG4125 | Production Planning & Control | Lecture (2 Credits)**

Utilize aspects of management to maximize productivity in a factory or service environment. Topics include sales & operations planning, inventory and capacity management, material requirements planning, and the theory of constraints.

**Prerequisite(s):** MATH1810

**IENG4135 | Operations Management | Lecture (2 Credits)**

Explain the planning, organization, coordination, and control of the resources needed to produce a company's goods and services. Topics include strategy alignment, capacity planning, aggregate plans, and the importance of work place safety.

**IENG4145 | Engineering Economic Analysis | Lecture (2 Credits)**

The concepts of finance and economics within the engineering environment. Analyze costs, risk, funding options, economic return on investment, and legal and environmental concerns.

**Prerequisite(s):** MATH1810

**IENG4210 | Simulation Modeling and Analysis | Lecture (3 Credits)**

Utilize simulation to create, analyze, and evaluate realistic models of real-world environments. Topics include Monte Carlo simulation, queuing theory, selecting input distributions, animation in simulation, and evaluating simulation output.

**Prerequisite(s):** MATH1810

**IENG4250 | Industrial Automation with Lab | Lec/Lab (3 Credits)**

Investigate and apply several automated processes used in manufacturing, service, and business processes. Topics include automated work systems, safety, and design of systems.

**Prerequisite(s):** MATH1820

**IENG4295 | Senior Capstone | Practicum (4 Credits)**

Demonstrate overall content knowledge of the program outcomes through a major project. Conduct a final presentation of the project and explain how it applies to the engineering program outcomes.

**Prerequisite(s):** WRIT4020

## Interior Design (IDSN)

**IDSN1111 | Basic Drafting & AutoCAD | Lecture (3 Credits)**

Basic hand drafting, Computer Aided Drafting, and design skills necessary to complete the drafting process of any given space using hand drafting equipment, plan reading, typical plan symbols and nomenclature to create appropriate line quality, architectural symbols and lettering, electrical symbols, elevations and sections. Emphasis is on architectural applications and building components utilized for Interior Design.

**IDSN1120 | Interior Design Careers | Lecture (1 Credit)**

Survey of the variety of career paths available using field trips, guest speakers, and research to differentiate the types of design practice.

**IDSN1130 | Color, Light & Design Fundamentals | Lecture (3 Credits)**

Explain hue, value, and intensity of color using color systems theories, and principles to evaluate the dynamics of color and light in interior space, what color is, why it happens, and how it is controlled. Elements of design (line, shape, texture, illusion of space, illusion of motion), and design principles (unity, emphasis, scale, balance, and rhythm) are applied in two- and three-dimensional projects to create a foundation for all future design decisions.

**IDSN1140 | Creative Thinking | Lecture (2 Credits)**

Utilize critical listening skills, mind/body connection to creativity, and the balance between the left and right side of the brain following the continuum of imagination, creation, and innovation through experiential group and individual projects to get a new idea, act on the idea, and create the next great thing.

**IDSN1210 | Freshman Studio | Studio (4 Credits)**

Apply the basic skills necessary to design interior spaces in a home using the typical industry design phases including programming, schematic design, and design development. Concept development, space planning, material and FF&E (Furnishings, Fixtures, and Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN1111 And IDSN1130

**IDSN1230 | Materials & Textiles | Lecture (3 Credits)**

Analyze materials and textiles for durability, biohazards, ease of use, life-cycle cost, sustainability, safety, and performance. Using an in-depth analysis of fiber, textile manufacturing, identification of yarns, weaves, finishing, and engineering to select end uses, and to understand the codes that apply to their use. Complete take-off calculations for fabric, wallcoverings, floor finish materials, and paint.

**IDSN1240 | Presentation Skills I | Lecture (3 Credits)**

The basics of graphics, methods and techniques, craftsmanship, and model making are applied with the necessary tools of presentation for communicating visually and verbally with a client.

**Prerequisite(s):** IDSN1110

**IDSN2111 | Studio 1 | Studio (4 Credits)**

Apply the basic skills necessary to design interior spaces in a small commercial space with an emphasis on non-profit organizations and small office spaces using the typical design phases including programming, schematic design, and design development. Concept development, space planning, material and FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN1210

**IDSN2140 | Lighting | Lecture (2 Credits)**

Select and specify luminaries and lamp types using principles of good lighting to construct well lit spaces. Emphasis on aesthetic considerations such as function, color rendition, and psychological factors.

**IDSN2170 | Building Technologies & Details | Lec/Lab (2 Credits)**

Identify and detail building construction elements using working shop drawings and specifications to communicate industry standards to clients and owners.

**IDSN2200 | Global Design | Lecture (3 Credits)**

Conduct interior design practice in a globalized market by studying cultures, mores, and design to make design decisions within the parameters of ecological, socioeconomic and cultural context.

**IDSN2210 | Studio 2 | Studio (5 Credits)**

Apply the intermediate skills necessary to design interior spaces in a home with an emphasis on kitchen and bath using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN2111

**IDSN2220 | Presentation Skills II | Lec/Lab (3 Credits)**

InDesign, Photoshop, and Illustrator are utilized to successfully combine the principles of color, layout, and visual communication with the skills of digital design, hand rendering, and sketching to produce successful and professional presentation drawings, boards, models, and documents.

**IDSN2230 | Travel Study | Travel Study (2 Credits)**

Experience the cultural differences, design treasures, and history of a foreign country with an opportunity for travel.

**Prerequisite(s):** IDSN2110

**IDSN3110 | Studio 3 | Studio (5 Credits)**

Apply the intermediate skills necessary to design interior spaces in a commercial space with an emphasis on corporate and health care using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN2210

**IDSN3120 | Revit for Interior Design | Lec/Lab (3 Credits)**

Advanced CAD drafting processes and procedures for practical application in Interior Design. Projects are modeled in 3D with an emphasis on custom objects or ?families?.

**IDSN3130 | Building Technologies & Details | Lecture (3 Credits)**

Identify and detail building construction elements using working shop drawings and specifications to communicate industry standards to clients and owners.

**Prerequisite(s):** IDSN1220

**IDSN3141 | Evidence Based Design | Lecture (1 Credit)**

Gather appropriate information and research findings to solve an interior design problem. APA format is used to produce a technical paper.

**IDSN3150 | Interior Design Seminar | Seminar (1 Credit)**

Prepare for Interior Design Internship which includes resume creation, interview preparation, and job discovery.

**Prerequisite(s):** IDSN3110

**IDSN3160 | 3D Design Ideation | Lec/Lab (2 Credits)**

Develop understanding of the three dimensional design process through research design, prototype construction, evaluation, and redesign. Increase perception of materiality.

**Prerequisite(s):** IDSN1111 And IDSN1210

**IDSN3170 | History of Interiors | Lecture (2 Credits)**

Differentiate styles of interiors, furniture, and decorative arts from ancient to present time Modern within their political and cultural context using research, field trips, and site visits to inform design decisions.

**IDSN3210 | Studio 4 | Studio (5 Credits)**

Apply the advanced skills necessary to design interior spaces in a commercial space with an emphasis on hospitality and historic preservation using the typical design phases including programming, schematic design, and design development. Concept development, space planning, and material & FF&E (Furniture, Fixtures, & Equipment) selection. Time sheets, budgets, visual presentation boards with CAD and manual drafting, and verbal presentation critiques by industry professionals.

**Prerequisite(s):** IDSN3110

**IDSN3220 | Interior Design Portfolio | Lec/Lab (2 Credits)**

Create portfolio by compiling projects to produce a representative sample of work.

**IDSN3230 | Project Management | Lecture (2 Credits)**

Principles and techniques for managing construction projects using team building, troubleshooting, site inspections, punch lists, and post-occupancy evaluations to complete a project on time and within budget.

**IDSN3240 | LEED | Lecture (1 Credit)**

An introduction to the processes and procedures associated with LEED certification as well as exam preparation.

**IDSN4110 | Studio 5 | Studio (5 Credits)**

Complete a project using all phases of the design process, including research, a preliminary budget, presentation, and contract documentation to create a project in a career specialty of interest.

**Prerequisite(s):** IDSN3210

**IDSN4120 | Internship for Interior Design | Internship (2 Credits)**

On-the-job training in the interior design industry to facilitate professional growth.

**Prerequisite(s):** IDSN3210

**IDSN4140 | Furniture Design | Lecture (3 Credits)**

Classic to contemporary styles of furnishings from iconic designers. Create an imaginative piece of furniture designed to meet a specific need.

**Prerequisite(s):** IDSN2120 And IDSN2240

**IDSN4210 | Capstone for Interior Design | Capstone (8 Credits)**

Complete a final project using all phases of the design process, including research, a preliminary budget, presentation, and contract documentation to create a project in a career specialty of interest.

**Prerequisite(s):** IDSN4110

**IDSN4211 | Capstone for Interior Design | Capstone (7 Credits)**

Complete a final project using all phases of the design process, including research, a preliminary budget, presentation, and contract documentation to create a project in a career specialty of interest.

**Prerequisite(s):** IDSN4110

**IDSN4221 | Business Practices | Lecture (1 Credit)**

Utilize specific interior design organizational and procedures through case studies, research, and team building to justify ethical and accepted standards of practice or business.

**Prerequisite(s):** IDSN3141 And IDSN3230

## Machine Tool Technology (MACH)

**MACH1000 | Machine Shop Fundamentals | Laboratory (2 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**MACH1110 | Machine Tool Fundamentals Lab | Laboratory (5 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1120

**MACH1120 | Machine Tool Fundamentals Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with basic principles in metal-cutting technology including machine feeds and speeds, threading, tapers, knurling, boring, radii cutting and milling and turning procedures.

**Prerequisite(s):** WRIT4020

**Corequisite(s):** MACH1110

**MACH1200 | Machine Shop Fundamentals | Laboratory (3 Credits)**

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.

**MACH1210 | Advanced Machining Lab | Laboratory (5 Credits)**

Advanced manufacturing of parts through layout, bench work and job planning. Advanced manual turning and milling and an introduction to CNC M & G codes. CNC portion includes manual programming via machine control and software simulation.

**Prerequisite(s):** MACH1110

**Corequisite(s):** MACH1220

**MACH1220 | Advanced Machining Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with advanced milling and turning operations, inspection of finished parts and an introduction to the G & M codes used in CNC programming. CNC portion includes manual programming in notepad and Immersive software simulation.

**Prerequisite(s):** MACH1120

**Corequisite(s):** MACH1210

**MACH2110 | CNC Lathe, Mill & Mold Making Lab | Laboratory (5 Credits)**

Advanced manufacturing processes using CNC lathes, CNC mill and EDM, design and build of an injection mold, along with hand and inspection tool techniques.

**Prerequisite(s):** MACH1210

**Corequisite(s):** MACH2120 MACH2130

**MACH2120 | CNC Lathe & Mill Theory | Lecture (2 Credits)**

Advanced CNC mill programming and introduction to CNC lathe programming. G & M codes, canned cycles, jigs, fixtures and work holding methods.

**Prerequisite(s):** MACH1220

**Corequisite(s):** MACH2110

**MACH2130 | Mold Design Theory | Lecture (2 Credits)**

Mold making methods and industry standard practices, history and uses. Design of one injection mold from concept to finished prints. Includes mold steels, press operation, molding cycle and inspection of finished parts.

**Prerequisite(s):** MACH1220

**Corequisite(s):** MACH2110

**MACH2140 | MasterCAM I | Lecture (4 Credits)**

2D and 3D geometry and surface model creation using MasterCAM software, an associative computer-aided manufacturing system for milling and turning. M and G code programs will be created, debugged and simulated cutter paths run for simple part geometries.

**Prerequisite(s):** MDES1110

**MACH2210 | CNC Mill, EDM & Die Making Lab | Laboratory (5 Credits)**

Advanced manufacturing processes using CNC lathe, CNC mill, wire EDM and sinker EDM. Design and build a complete blanking die, along with hand and inspection tool techniques to ensure proper fits and finishes. Explore the set up and operation of 4 axis machine tool.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MACH2220



**MACH2220 | CNC Mill & EDM Theory | Lecture (2 Credits)**

Advanced work holding principles, 4 axis CNC programming, axis definitions, wire EDM programming and power definitions.

**Prerequisite(s):** MDES1110

**Corequisite(s):** MACH2210

**MACH2230 | Die Design Theory | Lecture (2 Credits)**

Die design fundamentals and components including bend tolerances, cutting clearances, tonnage calculations, forming, and fits and clearances for dies.

**MACH2240 | MasterCAM II | Lecture (4 Credits)**

Advanced 3D design, surface and solid model creation using MasterCAM. Tool path creation and posting for both 2D and 3D geometry including advanced surface and solid models. Lathe part creation and programming in 2D.

**Prerequisite(s):** MACH2140

## Management (MGMT)

**MGMT1000 | Principles of Accounting | Lecture (3 Credits)**

Introduction to fundamental accounting concepts and cycles. Includes analyzing, interpreting, and recording transactions, as well as the preparation of financial statements, bank reconciliations and payroll transactions in accordance with commonly accepted accounting principles.

**MGMT1100 | Principles of Marketing | Lecture (3 Credits)**

Introduction to terms, concepts, and skills for analyzing marketing problems. Manage/integrate communication aspects of marketing, such as advertising, sales promotion, and public relations. Identify how to set objectives, select media and measure effectiveness. Explain sales promotion techniques.

**MGMT3110 | Principles of Management | Lecture (2 Credits)**

The contemporary supervision and operations management challenges stemming from changing organizational structures, complex environmental conditions, new technological developments, and increasingly diverse work forces. Focuses on critical issues in supervising, managing, and leading in an organization.

**MGMT3111 | Business Management | Lecture (4 Credits)**

Examine principles of management in the context of how firms are organized to analyze their management of finances, operations, human resources, processes and strategy to effectively meet an organization's mission, vision and goals.

**MGMT3112 | Business Management | Lecture (3 Credits)**

Examine principles of management in the context of how firms are organized to analyze their management of finances, operations, human resources, processes and strategy to effectively meet an organization's mission, vision and goals.

**MGMT3120 | Quality Systems | Lecture (2 Credits)**

Basic quality concepts, including the concepts of Total Quality Management (TQM), ISO9000, and LEAN/Six-Sigma concepts.

**MGMT3130 | Managerial Accounting | Lecture (2 Credits)**

Introduction of the fundamentals of managerial accounting for reporting, decision making and control of transactions, financial statements, strategic and operational planning to facilitate ethical behavior of the managerial accountant.

**MGMT3141 | Research for Business | Lecture (4 Credits)**

Introduction to the basics of research design, and the quantitative and qualitative methods used in addressing policy-relevant research questions. The course has two major goals: 1) Enhance passive literacy of quantitative and qualitative research methods; 2) Develop active skills and apply techniques to original policy studies.

**MGMT3211 | Project Management | Lecture (2 Credits)**

Examine management concepts through the lens of the project life cycle. Identify various techniques of work planning, control and evaluation used to achieve project objectives.

**MGMT3220 | HR/Employment Law | Lecture (2 Credits)**

Analyze the role of the human resource professional as a strategic partner in managing today's organizations. Examine key functions such as recruitment, selection, development, appraisal, retention, compensation, and labor relations. Workplace safety, employment laws, legal rights and responsibilities are incorporated.

**MGMT3230 | Strategic Planning | Lecture (2 Credits)**

Examine the strategy of the business unit and analyze the issues central to a firm's short and long term competitive success. Investigate various models and approaches to designing and conducting strategic planning.

**MGMT4110 | Leadership | Lecture (2 Credits)**

Multidimensional study of leadership related to contemporary issues, privileges and responsibilities through an exploration of historical leaders, leadership styles and philosophies to recognize the traits, skills and values of a leader.

**MGMT4120 | Leading Organizational Change | Lecture (2 Credits)**

Examine the competencies and skills required to successfully lead organizational and personal change in the business world.

**MGMT4130 | Entrepreneurial/Marketing Management | Lecture (2 Credits)**

Entrepreneurial and marketing management fundamentals of planning, strategy, management and issues using skills and competencies needed to generate new ideas to develop a successful business.

**MGMT4140 | Managerial Economics | Lecture (2 Credits)**

Apply managerial economic decision making in the areas of mathematics, statistics, economic theory, accounting, finance, marketing, and human behavior.

**MGMT4210 | Capstone Research | Capstone (4 Credits)**

The research portion of an industry(field)-specific capstone project of student's choice; present a comprehensive project within a field of study, that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT3110, MGMT3120, MGMT3130, MGMT3220, MGMT4130, And WRIT4001

**MGMT4220 | Negotiation & Conflict Resolution | Lecture (2 Credits)**

Strategies and tactics for conflict analysis, assessment and negotiation using exercises and simulations to successfully manage negotiations and conflict.

**MGMT4230 | Management Information Systems I | Lecture (2 Credits)**

The ways in which management and information services influence business strategies, communications technology, information systems analysis and design; issues arising out of the rapidly evolving field of information systems, and a general overview of IT compliance.

**MGMT4240 | Applied Management Capstone | Capstone (4 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001



**MGMT4241 | Applied Management Capstone | Capstone (1 Credit)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

**MGMT4242 | Applied Management Capstone | Capstone (2 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

**MGMT4243 | Applied Management Capstone | Capstone (3 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

**MGMT4245 | Applied Management Capstone | Capstone (5 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

**MGMT4246 | Applied Management Capstone | Capstone (6 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

**MGMT4249 | Applied Management Capstone | Capstone (9 Credits)**

The written portion of an industry (field)-specific capstone project of student's choice; present a comprehensive project within a field of study that draws on the relevant components of previous course work.

**Prerequisite(s):** MGMT4210 And WRIT4001

## Mathematics (MATH)

**MATH1000 | Algebra & Trigonometry | Lecture (3 Credits)**

Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations; trigonometric functions, solutions of triangles, radians, trig functions graphs, vectors, and basic identities.

**General Education:** Mathematics

**MATH1050 | Algebra, Trigonometry & Geometry | Lecture (3 Credits)**

Principles of algebra, geometry and trigonometry used in the context of a technical setting. Problem-solving strategies are developed and applied to technology.

**General Education:** Mathematics

**MATH1110 | Introductory College Algebra | Lecture (2 Credits)**

Real numbers and polynomials, exponents and radicals, fractional equations; proportions and linear equations.

**General Education:** Mathematics

**MATH1200 | Machine Math | Lecture (3 Credits)**

Translation of engineering drawing dimensions to machine working dimensions. Integration of algebra, geometry and trigonometry to solve machine applications. Applications of compound angles.

**General Education:** Mathematics

**MATH1250 | Boolean Algebra | Lecture (3 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

**MATH1300 | Boolean Algebra & Number Systems | Lecture (2 Credits)**

Binary, octal and hexadecimal number systems. Boolean algebra and mapping.

**General Education:** Mathematics

**MATH1350 | Concepts of Calculus | Lecture (3 Credits)**

Systems and graphs of linear and quadratic equations, functions, limits, differentiation, implicit differentiation, related rates, integration; applications of the derivative and integral.

**General Education:** Mathematics

**MATH1500 | Algebra, Trig & Boolean Algebra | Lecture (5 Credits)**

Polynomials, proportions and linear equations. Trig functions, graphs, and vectors. Binary, octal and hexadecimal number systems. Boolean Algebra and mapping.

**General Education:** Mathematics

**MATH1700 | Pre Calculus | Lecture (3 Credits)**

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

**General Education:** Mathematics

**MATH1810 | Calculus I | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MACH2140

**Corequisite(s):** IENG3220, PHYS1800, PHYS1810

**General Education:** Mathematics

**MATH1811 | Calculus I | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Utilize multiple methods in the calculation and application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

**Prerequisite(s):** MACH2140

**Corequisite(s):** PHYS1800 PHYS1810

**General Education:** Mathematics

**MATH1820 | Calculus II | Lecture (3 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements, such as calculating the area under curves or the capacities inside of complex geometries. Computer software will enable the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH2200

**Corequisite(s):** PHYS1820

**General Education:** Mathematics

**MATH1821 | Calculus II | Lecture (4 Credits)**

The fundamental tool used by engineers and scientists to determine critical measurements such as the area under curves, the volumes within complex geometries, and for describing functions as an infinite series. Computer software enables the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MENG1230 PHYS1820

**General Education:** Mathematics

**MATH1910 | Mathematics Topics I | Lecture (1 Credit)**

Topics in mathematics selected by faculty assigned to the course.

**General Education:** Mathematics

**MATH1920 | Math Special Topics II | Lecture (2 Credits)**

MATH Special Topics II focuses on topics in math selected by faculty assigned to the course.

**General Education:** Mathematics

**MATH2250 | Statistics | Lecture (3 Credits)**

Descriptive and inferential statistics, frequency distributions, probability theory, and issues related to gathering data; computer spreadsheets facilitate the organization, analysis and display of data.

**General Education:** Mathematics

**MATH2260 | Probability & Statistics | Lecture (4 Credits)**

Introduction to probability and statistics with applications. Topics include: basic combinatorics, random variables, probability distributions, hypothesis testing, confidence intervals, and linear regression.

**Prerequisite(s):** MATH1820 Or MATH1821

**General Education:** Mathematics

**MATH2810 | Multi-Variable Calculus | Lecture (4 Credits)**

Differentiate and integrate functions of two and three variables. Apply differentiation and integration techniques to physical sciences and engineering. Explore the theorems of Green and Stokes.

**Prerequisite(s):** MATH1820

**General Education:** Mathematics

**MATH2820 | Linear Algebra & Differential Equations | Lecture (4 Credits)**

Introduction to Linear Algebra, including vector spaces and linear mappings between such spaces. Explore solution methods for ordinary differential equations, qualitative techniques; includes matrix methods approach to systems of linear equations and series solutions.

**Prerequisite(s):** MATH1810 And MATH1820

**General Education:** Mathematics

**MATH3000 | Intermediate Statistics | Lecture (2 Credits)**

Descriptive statistics, frequency distribution, normal probability functions and sampling distributions, estimation of population parameters, tests of statistical hypotheses and inference, t, F, chi-square, correlation, regression analysis and analysis of variance.

**General Education:** Upper Mathematics

## Mechanical Engineering (MENG)

**MENG1110 | Engineering Drawings & 3D Design | Lecture (4 Credits)**

Create 3D solid models and assemblies using SolidWorks. Interpret engineering prints; create detail and assembly drawings according to standards. Use freehand drawing as a graphical communication tool.

**MENG1120 | Introduction to Engineering | Lecture (3 Credits)**

Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

**MENG1210 | Machining for Engineers Lab | Laboratory (2 Credits)**

Employ metalworking techniques using typical shop equipment including mills, lathes, grinders, saws, and drills. Utilize hand tools to prep stock and finish edges.

**Prerequisite(s):** MDES2130

**Corequisite(s):** MENG1220

**MENG1220 | Machining for Engineers | Lecture (2 Credits)**

Use theory and understanding of machining operations to plan work to create parts efficiently.

**Prerequisite(s):** MDES2130

**Corequisite(s):** MENG1210

**MENG1230 | Statics | Lecture (3 Credits)**

Identification, recognition and calculations associated with forces acting on rigid bodies at rest. Use vector analysis to analyze concurrent forces, non-concurrent forces, friction forces, centroids and moments.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1821

**MENG2110 | Introduction to Programming | Lecture (3 Credits)**

Create programs to solve engineering problems. Apply modular design approaches, decision and loop structures, and object-oriented methods to write clear and efficient code for mechanical engineering applications.

**MENG2120 | Dynamics | Lecture (3 Credits)**

Theory and calculations associated with kinematics and kinetics of particles, systems of particles and rigid bodies. Analyze the application of Newton's laws to the planar motion of rigid bodies.

**Prerequisite(s):** MENG1230

**MENG2130 | Materials Science | Lecture (3 Credits)**

Identify different types of materials, their properties, and appropriate uses. Fabrication techniques such as welding, brazing, modeling, and stamping are included.

**Prerequisite(s):** MENG1220

**MENG2210 | Electrical & Controls Engineering Lab | Laboratory (2 Credits)**

Apply electrical and electronic controls to solve real-world problems. Topics include AC and DC motors, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**Prerequisite(s):** PHYS1820

**Corequisite(s):** MENG2220

**MENG2220 | Electrical & Controls Engineering | Lecture (2 Credits)**

Identification, recognition and calculations associated with electrical and electronic controls. Topics include AC and DC motors calculations, wiring diagrams, Ohm's Law, series and parallel circuits, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**Prerequisite(s):** PHYS1820

**Corequisite(s):** MENG2210

**MENG2230 | Dynamics | Lecture (3 Credits)**

Theory and calculations associated with kinematics and kinetics of particles, systems of particles and rigid bodies. Analyze the application of Newton's laws to the planar motion of rigid bodies.

**Prerequisite(s):** MENG1230

**MENG2240 | Mechanics of Materials | Lecture (3 Credits)**

Discover how materials behave under load including deformation under various loading profiles. Apply concepts to design of mechanical members such as beams, shafts, columns, and other load bearing devices.

**Prerequisite(s):** MENG1230

**MENG3110 | Dsgn for Manufacturability & CAD/CAM Lab | Laboratory (1 Credit)**

Use CAD/CAM software to create part geometries, tool paths, machining parameters and post processes NC code. Design and create parts using other common manufacturing processes, such as casting, injection molding, and sheet metal forming processes.

**Prerequisite(s):** MENG1210

**Corequisite(s):** MENG3120

**MENG3120 | Design for Manufacturability & CAD/CAM | Lecture (2 Credits)**

Introduction to common manufacturing processes, with emphasis on the principles of design for each process. Processes include: sheet metal forming, casting, welding, and plastic fabrication.

**Prerequisite(s):** MENG1220 And MENG1210

**Corequisite(s):** MENG3110

**MENG3130 | Introduction to Thermodynamics | Lecture (4 Credits)**

Theory and calculations associated with the principles of thermal energy as well applications of the first and second laws of thermodynamics. Topics include work and heat, control volume, steady states, uniform states, entropy, availability, power and refrigeration.

**Prerequisite(s):** MATH2820 And PHYS1800

**MENG3140 | Materials Science | Lecture (3 Credits)**

Identify different types of materials, their properties, and appropriate uses. Processes that change material properties include: alloy composition, heat treatment, coatings, and other modifications.

**Prerequisite(s):** MENG1220 And CHEM2110

**MENG3210 | GD&T & Measurements Lab | Laboratory (2 Credits)**

Use lab metrology equipment to assess the geometric dimensions and tolerances of parts, and to perform other mechanical measurements such as temperature, pressure, and flow.

**Prerequisite(s):** MENG3130

**Corequisite(s):** MENG3220

**MENG3220 | GD&T & Measurements | Lecture (2 Credits)**

Apply principles of physical measurements and error analysis to evaluate mechanical measurements. Create prints that include callouts for standards of accuracy using ASME/ANSI geometric dimensioning and tolerance standards.

**Prerequisite(s):** MDES1110 Or MENG1110

**Corequisite(s):** MENG3210

**MENG3230 | Fluid Mechanics | Lecture (3 Credits)**

Introduction to fluid statics and mechanics; laminar and turbulent flow with associated calculations. Applications to industry are used in problems.

**Prerequisite(s):** MATH2820

**MENG3240 | Failure Analysis & Design | Lecture (2 Credits)**

Examine advanced topics in modeling, design and best practices for machines, tooling and system assemblies. Evaluate components for protection against failure from low cycle fatigue, high cycle fatigue, ductile overload, corrosion.

**Prerequisite(s):** MENG2240

**MENG3250 | Introduction to Heat Transfer | Lecture (3 Credits)**

Examine the fundamentals of heat transfer modes including conduction, convection, and radiation. Calculations for each mode are included.

**Prerequisite(s):** MATH2820 And MENG3130

**MENG4110 | Transmission of Power Lab | Laboratory (2 Credits)**

Assemble and test mechanical power transmission systems, including gearboxes and fluid power systems. Correctly size components and evaluate power losses, service life, and safety factors.

**Prerequisite(s):** MATH2820 And MENG3130

**Corequisite(s):** MENG4120

**MENG4120 | Transmission of Power | Lecture (2 Credits)**

Apply principles of mechanical design and material failure to the design and analysis of mechanical power transmission components, such as gears, linkages, shafts, bearings and cams.

**Prerequisite(s):** MATH2820 And MENG3240

**Corequisite(s):** MENG4110

**MENG4130 | Finite Element Analysis | Lecture (3 Credits)**

Finite element modeling using both manual and software simulation analysis. Topics include two- and three-dimensional elements along with applications in solid mechanics, heat transfer and fluid mechanics.

**Prerequisite(s):** MATH2820

**MENG4140 | Senior Design I | Capstone (4 Credits)**

Student design teams execute a two semester design project to solve a real world problem. Application of the design process, underlying science, and application of concepts and tools gained in the curriculum are necessary. Application of project management principles and tools.

**MENG4150 | Principles of Quality & Lean Mfg | Lecture (3 Credits)**

Investigate several quality conventions used to reduce waste, improve quality, decrease production times, and improve customer satisfaction. Topics include statistics, queuing models, control charts for variables, acceptance criteria, and acceptance sampling.

**Prerequisite(s):** MATH2260

**MENG4210 | Heat Transfer Applications & HVACR Lab | Laboratory (2 Credits)**

Hands-on testing of heat transfer devices including heat, ventilation, and air conditioning systems.

**Prerequisite(s):** MENG3250

**Corequisite(s):** MENG4220

**MENG4220 | Heat Transfer Applications & HVACR | Lecture (2 Credits)**

Apply heat transfer theory to common industrial devices. HVACR and other applications are analyzed.

**Prerequisite(s):** MENG3250

**Corequisite(s):** MENG4210

**MENG4230 | Engineering Economics | Lecture (2 Credits)**

Combines the concepts of finance and economics with the engineering environment. Analyze costs, risk, funding options, economic return on investment, legal and environmental concerns.

**MENG4240 | Senior Design II | Capstone (4 Credits)**

Continuation of Senior Design I projects. Final deliverables are submitted, project is presented and closed out. Presentations are open to students, faculty, and the public in a symposium format.

**Prerequisite(s):** MENG4140

**MENG4250 | Engineering Ethics | Lecture (1 Credit)**

Interpret the connection between personal morality, the role of engineers and engineering in society, and relationship to one's employer. Case studies involving conflicts within these roles are reviewed and evaluated.

**MENG4251 | Engineering Ethics | Lecture (2 Credits)**

Interpret the connection between personal morality, the role of engineers and engineering in society, and relationship to one's employer. Case studies involving conflicts within these roles are reviewed and evaluated.

**MENG4260 | Design of Experiments | Lecture (2 Credits)**

Introduction to industrial experimentation through the use of statistical software to perform mathematical regression and analysis of variance for system functionality. Topics include randomized designs, blocking designs, full factorial designs and fractional factorial designs.

**Prerequisite(s):** MATH2260

## Mopar Career Automotive Program (MCAP)

**MCAP1001 | Mopar Fundamentals | Lec/Lab (3 Credits)**

Identify the steps that should be performed for vehicle maintenance. Perform a vehicle inspection. Perform a step-by-step process to complete a New Vehicle Preparation service procedure. Practical usage of meters and lab scope operation to quickly and accurately perform electrical diagnosis. Identify the different types of sensors, control and load devices in vehicle electronic architectures. Identify modules that require programming after replacement and properly program a module after replacement. Identify operating characteristics and diagnose components of the various communication networks on vehicles.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP1005 | Noise, Vibration & Harshness | Lec/Lab (1 Credit)**

Isolation of components, use of special tools, current problem resolution, and interpretation of system component frequencies. The six-step diagnostic approach is used along with the sirometer to demonstrate amplitude and frequency of a vibration. Identify terms necessary for diagnosing NVH concerns. Calculate NVH frequencies necessary for component classification. Identify test equipment and tools used in diagnosing and correcting NVH concerns.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1011 | Mopar Engines | Lec/Lab (2 Credits)**

Differentiate between Cam in Block and Cam in Head engines. Locate components and perform specific repair procedures. Use the manufacturer special tools developed for these engines. Inspect and service the timing system. Service upper engine components and adjustment procedures. Service lower engine components. Explain cooling system operation and coolant flow. Describe oil flow through the engine. Identify the characteristics of engine mechanical diagnosis, for the following areas of concern: engine assembly noises, cooling system problems, and oil loss. Perform selected engine mechanical diagnostic tests listed in the manufacturer service information and analyze test results to determine necessary repairs.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1021 | Mopar Automatic Drivetrain | Lec/Lab (3 Credits)**

Explain the purpose of automatic transmission fluid, the available fluid types, and the various ways of checking fluid level. Identify the laws of hydraulics and Pascal's law. Identify the purpose, operation, and construction of a torque converter, as well as the concepts of fluid coupling and torque multiplication. Identify the purpose, construction and operation internal gear train components, specifically planetary gear sets, clutch packs, and overrunning clutches. Explain transmission power flow, with regards to the operation of planetary gear sets to get reduction, second gear, direct drive, overdrive, and reverse. Identify purpose, construction and operation of transmission hydraulics & controls, specifically the oil pump and sump, valve body, and accumulators. Use manufacturer special tools to disassemble and reassemble automatic transmissions. Identify the purpose and operation of all transmission electrical direct input and output devices.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1031 | Mopar Manual Drivetrain | Lec/Lab (2 Credits)**

Disassemble, explain powerflow, and reassemble manual transmissions, transfer cases and differentials. Identify components by using the identification tag. Identify the purpose and operation of precision tools including feeler gauge set, micrometer, dial indicator, dial caliper, dial and beam style torque wrenches. Differentiate between front wheel drive and rear wheel drive transmission components. Compare the powerflow through a front wheel drive and a rear wheel drive manual transmission. Determine the lubrication requirements for the different types of manual driveline assemblies. Identify the electronic operation of the various manual driveline controls. Identify the various clutch types, components, and release components. Differentiate between 4WD and AWD systems.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1041 | Mopar Steering & Suspension Systems | Lec/Lab (1 Credit)**

Identify types, characteristics, and diagnostics of power steering systems. Perform power steering system pressure analysis. Identify test equipment and analyze tire pressure monitoring systems. Identify the various suspension types available for automotive applications. Explain the function of steering components as they relate to an automotive steering system.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1051 | Mopar Braking Systems | Lec/Lab (1 Credit)**

Identify the components and function of typical antilock brake systems (ABS). Identify and test the types of ABS control module inputs and outputs. Explain the procedure for bleeding brake fluid in an ABS. Use manufacturer special tools to diagnose electrical components related to the brake system. Differentiate among traction control, roll mitigation, electronic brake distribution, and electronic stability control.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1061 | Mopar Electrical & Body Systems | Lec/Lab (2 Credits)**

Perform the manufacturer recommended diagnostic and test procedures for vehicle electrical systems. Select, connect and interpret the results of the Lab scope readings. Locate and identify restraint system components. Decode the restraint systems information from the vehicle identification number (VIN). List all components requiring replacement or inspection after air bag deployment. Identify the cause of an illuminated airbag warning lamp. Identify and diagnose stored and active DTC's. Identify, locate, and diagnose items such as vehicle theft alarm, lighting, and power systems. Identify and use tools required to service interior and exterior trim component. Identify fasteners required to service interior and exterior body trim components. Diagnose major sources of wind noise and water leak issues. Remove and install a door module. Research proper operation of a sunroof system.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1071 | Mopar Climate Control | Lec/Lab (2 Credits)**

Examine the principles of heat transfer. Correlate refrigerant pressure and temperature along with their effects on the boiling point of water and refrigerant. Identify A/C components, electrical components and controls, in automotive air conditioning and heating systems. Use HVAC service procedures as well as A/C recovery and recycling equipment to repair HVAC concerns. Complete an EPA approved A/C recovery and recycling certification.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001



**MCAP1081 | Mopar Powertrain Performance | Lec/Lab (3 Credits)**

Examine the principles of the speed density and mass air flow fuel injection system including methods of determining air, fuel and spark requirements. Identify idle control, and principles of major input and output circuit operation along with the major subsystems operated by the Powertrain Control Module (PCM); locate and test power, grounds, and voltage sense circuits. Identify the different types of ignition systems along with the primary and secondary circuits. Identify the operation of the Up and Downstream O2 sensor, open and closed loop operation and their effect on fuel injector pulse width. Identify the operation of the catalytic converter and other emission controls such as EGR and EVAP systems. Diagnose vehicles with manufacturer test equipment. Explain how OBDII began, how it is currently implemented along with requirements and why they are necessary. Describe current emission control systems, diagnostic tools; diagnostic trouble codes, freeze frame data, and monitors.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP1091 | Mopar Diesel Systems | Lec/Lab (1 Credit)**

Examine the principles, operation, and diagnosis of diesel engines. Identify the components and operation of diesel air induction systems. Test the components and operation of the various diesel fuel systems. Identify the components and operation of the diesel electronic control systems as well as the components and operation of the various diesel exhaust emissions and after-treatment systems. Perform various tests and diagnostic routines available with the Chrysler Diagnostic Scan tool.

**Prerequisite(s):** AUTO1110, AUTO1120, AUTO1130, And MCAP1001

**MCAP2510 | MCAP Internship I | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2520 | MCAP Internship II | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2530 | MCAP Internship III | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2540 | MCAP Internship IV | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, following the procedures outlined in the MCAP Internship manual, working under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2550 | MCAP Internship V | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, following the procedures outlined in the MCAP Internship manual, working under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2560 | MCAP Internship VI | Internship (2 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**MCAP2570 | MCAP Internship VII | Internship (3 Credits)**

Perform an internship at a sponsoring Chrysler, Dodge, Jeep? or Ram dealership, follow the procedures outlined in the MCAP Internship manual, work under the supervision of the dealership service management. The Dunwoody CAP coordinator will oversee the internship.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

## Philosophy (PHIL)

**PHIL1000 | Introduction to Logic | Lecture (2 Credits)**

Examine the principles of correct reasoning through the use of language; utilize formal rules of deductive reasoning.

**General Education:** Humanities

**PHIL2000 | Introduction to Philosophy | Lecture (3 Credits)**

Introduction to the main areas of philosophy through the examination of classic and contemporary sources. General topics include knowledge, existence, and value. Develop the ability to critically examine fundamental beliefs and concepts, reason intelligently about pivotal questions, and express such thought clearly.

**General Education:** Humanities

## Physics (PHYS)

**PHYS1000 | Physics | Lecture (3 Credits)**

Principles and methodologies of physics are used in the context of natural phenomena. Focus is on technical, societal and conceptual aspects of physics.

**General Education:** Natural Sciences

**PHYS1001 | The Physics of Newton's Laws | Lec/Lab (2 Credits)**

Principles and methodologies of physics used in the context of natural phenomena. Focus is on technical, societal and conceptual aspects of physics. Labs included.

**General Education:** Natural Sciences

**PHYS1010 | Physics with Lab | Lec/Lab (3 Credits)**

Principles and methodologies of physics used in the context of natural phenomena. Focus is on technical, societal and conceptual aspects of physics. Labs included.

**General Education:** Physical Sciences with Lab

**PHYS1800 | Physics I with Lab | Lec/Lab (4 Credits)**

Introduction to mechanics using differential calculus as a foundation. Topics include kinematics and dynamics of linear motion, static equilibrium, the conservation of energy and momentum, mechanics of solids and fluids, and thermodynamics. The laboratory portion incorporates experimentation, instrumentation, and graphical tools to verify calculations in motion, mechanics and thermodynamics.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Physical Sciences with Lab



**PHYS1810 | Calculus-Based Physics | Lecture (3 Credits)**

Introduction to mechanics using calculus, vectors and graphs to describe motion, and to analyze it in terms of forces and conservation laws.

Applications include projectiles, orbits, oscillations and fluids.

**Prerequisite(s):** MATH1810 Or MATH1811

**Corequisite(s):** MATH1810 MATH1811

**General Education:** Natural Sciences

**PHYS1820 | Physics II with Lab | Lec/Lab (4 Credits)**

An introductory calculus-based course in electromagnetic fields and their applications. Topics include: Coulomb's and Gauss' Law, electric fields and potentials, electrical and magnetic properties of matter, Ampere's and Faraday's laws, elementary DC and AC circuits, Maxwell's equations, and electromagnetic waves.

**Prerequisite(s):** MATH1821, Or MATH1820, And PHYS1800

**Corequisite(s):** MATH1820 MATH1821

**General Education:** Physical Sciences with Lab

## Pre-Media Technologies (PREP)

**PREP1220 | Advanced Image Editing | Laboratory (1 Credit)**

A lab intensive investigation into high end color retouching and photo enhancement, cosmetic retouching, CameraRAW, advanced layer work and special effects.

**Prerequisite(s):** GAPT1230

**PREP2111 | Advanced Structural Design | Lec/Lab (2 Credits)**

Design and produce elaborate folded structures such as free standing displays and pop-up designs, as well as other paper, paperboard and corrugated structures including furniture and other recyclable and useful products. Produce virtualized 3D visualizations of designs prior to committing them to physical material. Opportunity to compete for national recognition in folding carton design may be available through this class.

**Prerequisite(s):** GAPT1210

**PREP2120 | Imposition & Variable Output | Lec/Lab (2 Credits)**

Inquiry into the many techniques used for the organized output of multiple pages, designs or images. Page imposition, step and repeat, ganging and nesting are considered. Examine the basic software and workflow tools and techniques for personalized printing, variable data, and one-to-one marketing.

**Prerequisite(s):** PREP1210 Or GAPT1210

**PREP2130 | Job Engineering | Lec/Lab (2 Credits)**

A lab-intensive inquiry into the planning, execution and automation of pre-media workflow in order to maximize efficiency, productivity and repeatability in a fast-paced networked environment. Use the latest high end pre-media software in conjunction with Adobe Creative Suite.

**Prerequisite(s):** PREP1210 Or GAPT1210

**PREP2210 | Asset Management | Laboratory (1 Credit)**

Industry's best practices related to the storage, back up, organization, cataloging, retrieval and repurposing of digital assets; includes naming conventions, compression techniques, metadata, RAID levels and cloud storage.

**PREP2220 | 3-D Imaging | Laboratory (1 Credit)**

The creation and manipulation of three-dimensional images intended for online use for video, animations and remote proofing, using Adobe Illustrator, Photoshop, ArtiosCAD and Studio Visualizer.

**PREP2230 | Large Format Production | Laboratory (1 Credit)**

The creation, printing, finishing and installation of graphics intended for large and grande format inkjet output. Produce and install floor graphics, murals and wraps.

**PREP2240 | Pre-Media Portfolio | Studio (1 Credit)**

The planning, organization and preparation of both physical and digital presentations demonstrating breadth of competencies and individual strengths, for the purpose of professional advancement.

**PREP2250 | Pre-Media Capstone | Capstone (4 Credits)**

Applying and developing technical skills and professional behavior for pre-media technicians; a closely supervised, project-based experience.

**PREP2253 | Pre-Media Capstone | Capstone (3 Credits)**

Apply and develop technical skills and professional behavior for graphic designers; a closely supervised, project based experience.

## Psychology (PSYC)

**PSYC1000 | Psychology | Lecture (3 Credits)**

The science of human behavior; the history of the discipline, biological foundations, personality, measurement, learning, stress and mental disorders.

**General Education:** Social Sciences

**PSYC3000 | Organizational Behavior | Lecture (2 Credits)**

Basic principles of human behavior that are used when managing individuals and groups in organizations. Includes theories relating to individual differences in abilities and attitudes, attribution, motivation, group dynamics, power and politics, leadership, conflict resolution, organizational culture, organizational structure and design as well as the process of ethical decision making for the employee, manager, and organization.

**General Education:** Upper Social Sciences

**PSYC3100 | Psychology of Group Dynamics | Lecture (3 Credits)**

Explore core foundations of human behavior in groups. Analyze differences in human needs for inclusion, identity and group affiliation. Evaluate human drives toward leadership and cohesion. Discriminate between situational factors that may foster obedience, conformity, group-think, and crowd behavior.

**General Education:** Upper Social Sciences

## Radiologic Technology (RTEC)

**RTEC1110 | Introduction to Radiography | Lecture (2 Credits)**

An overview of radiography and patient care. Orientation to the radiographic profession as a whole. Introduction to the skills required to perform radiologic procedures with an emphasis placed on the production and evaluation of quality radiographs. Topics include: equipment introduction, ethics, medical, and legal considerations; procedures and anatomy related to the chest and abdomen.

**RTEC1120 | Patient Care | Lecture (2 Credits)**

Examine the basic fundamentals required to assess a patient's condition, identify emergency situations, and respond to acute life threatening situations within their scope of practice. Determine the foundations of quality patient care and care management plans, both as an individual and as a vital team player. Emphasis is on fundamental principles, practices, and issues common to radiography.

**RTEC1130 | Radiographic Procedures I | Lecture (1 Credit)**

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the upper extremities, the shoulder girdle, and the lower extremities.

**RTEC1140 | Medical Terminology | Lecture (1 Credit)**

Develop a medical vocabulary. Skills in spelling, pronunciation, and defining medical terms is emphasized.

**RTEC1150 | Clinical I | Clinical (3 Credits)**

Introduction to the hospital clinical setting; provides an opportunity to participate in or observe radiographic procedures. Topics include: orientation to hospital or clinic areas and procedures, mobile/surgery, and radiography. Participate in and/or observe procedures related to chest and abdomen. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

**Prerequisite(s):** RTEC1110

**RTEC1210 | Radiologic Exposure | Lecture (1 Credit)**

Examine the factors that govern and influence the production of the radiographic image, includes exposure calculations.

**RTEC1220 | Radiographic Procedures II | Lecture (1 Credit)**

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the lower extremities, the pelvic girdle, and the spine.

**Prerequisite(s):** RTEC1130

**RTEC1230 | Radiographic Procedures III | Lecture (1 Credit)**

Develop the knowledge required to perform radiographic procedures. Topics include: anatomy and routine projections of the lumbosacral spine, the bony thorax, the cranium, facial bones, and sinuses; anatomy and procedures of the upper gastrointestinal (GI).

**Prerequisite(s):** RTEC1220

**RTEC1240 | Clinical II | Clinical (3 Credits)**

Continue learning experiences in the clinic or hospital setting. Topics include: equipment utilization, exposure techniques, participation in and/or observation of routine projections of the upper and lower extremities. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

**RTEC1250 | Clinical III | Clinical (3 Credits)**

Continue learning experiences in the clinic or hospital setting. Focus is on the pelvis, the spine, and common portable radiography procedures. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

**RTEC1310 | Radiographic Procedures IV | Lecture (1 Credit)**

Continue to develop the knowledge required to perform radiographic procedures. Topics include: anatomy and procedures of the lower gastrointestinal (GI), genitourinary (GU), the biliary system, and minor system procedures.

**Prerequisite(s):** RTEC1230

**RTEC1320 | Clinical IV | Clinical (3 Credits)**

Continue hospital or clinic setting work experience. Develop proficiency in executing procedures introduced in Radiographic Procedures. Focus is on bony thorax, cranial bone, facial bone, and sinuses. Examine common fluoroscopic procedures and common radiographic procedures in surgery. Execution of radiographic procedures is conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2110 | Radiologic Science | Lecture (1 Credit)**

Concepts of basic radiographic physics and the basics of x-ray generating equipment.

**Prerequisite(s):** RTEC1210

**RTEC2121 | Advanced Imaging | Lecture (1 Credit)**

Equipment routinely utilized to produce diagnostic images, as well as various recording media and techniques. Topics include: Venipuncture; Image production in CT, MRI, IR, and other imaging modalities; special imaging considerations for geriatric, pediatric, trauma, and mobile imaging procedures; and sectional anatomy of the head, thorax, and abdomen.

**Prerequisite(s):** RTEC1310

**RTEC2130 | Clinical V | Clinical (6 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: common fluoroscopic, surgery, and portable radiography procedures. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2210 | Radiation Biology & Protection | Lecture (1 Credit)**

Radiation detection and measurement, patient protection, personnel protection, absorbed dose equivalencies, agencies and regulations, introduction to radiation biology, cell anatomy, radiation/cell interaction and effects of radiation.

**RTEC2220 | Radiologic Topics I | Lecture (1 Credit)**

A review of basic knowledge from previous courses to help the student prepare for the national certification examination. Topics include: image analysis, pathology, quality assurance, digital radiography, computers and PACS.

**RTEC2230 | Radiologic Topics II | Lecture (1 Credit)**

Quality assurance, digital imaging, image analysis, resume and career planning; a review of basic knowledge from previous courses to help the student prepare for the national certification examination.

**RTEC2240 | Ethics in Healthcare | Lecture (1 Credit)**

Increase awareness of the many complex issues that face the healthcare industry; critically evaluate an issue taking into consideration all sides and opinions along with supporting reasoning.

**RTEC2250 | Clinical VI | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: advanced radiographic anatomy; equipment utilization; exposure techniques; sterile techniques; participation in and/or observation of angiographic, interventional and specialty rotations including MRI and CT. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2260 | Clinical VII | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Topics include: advanced radiographic anatomy; equipment utilization; exposure techniques; sterile techniques; participation in and/or observation of angiographic, interventional and specialty rotations including MRI and CT. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

**RTEC2310 | Radiologic Topics III | Lecture (1 Credit)**

A review of basic knowledge from previous courses to help the student prepare for the national certification examination. Topics include: image analysis, image production and evaluation; radiographic procedures; anatomy, physiology, pathology, and terminology; equipment operation and quality control; radiation protection; and patient care and education.

**RTEC2320 | Clinical VIII | Clinical (3 Credits)**

Continues student learning experiences in the clinic or hospital setting; build on skills learned and competencies achieved in the previous semester. Includes participation in and/or observation of routine and special radiographic procedures. Execution of radiographic procedures will be conducted under direct and indirect supervision of experienced registered technologists.

## Research (RSCH)

### RSCH4000 | Research Methods | Lecture (3 Credits)

Analyze paradigms, methodologies, and rigorous writing processes for academic and practitioner works. Focus is on the critical investigation of readings, claims, planning, and research ethics.

**General Education:** Upper Communications

## Right Skills Now for Manufacturing (CNC) (RSNM)

### RSNM1100 | Measurement, Materials & Safety | Lec/Lab (2 Credits)

Manufacturing of parts through layout and bench work, includes the use of band saws, drill presses, surface grinders, manual lathes, and vertical mills. Basic principles in metal-cutting technology includes threading, tapers, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table, and the many other milling and turning operations.

### RSNM1110 | Job Planning, Benchwork & Layout | Lec/Lab (2 Credits)

An exploration of the basics of hand tools, understanding drawings, manual machines, and layout. Interpret drawing information, describe basic symbols and notation, and interpret basic GD&T feature control frames. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

### RSNM1120 | CNC Milling Level I | Lec/Lab (3 Credits)

Introduction to basic milling operations. Examine manual and CNC milling practices. Utilize tooling, machining practices and applied mathematics. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

### RSNM1130 | CNC Turning Level I | Lec/Lab (3 Credits)

Introduction to basic lathe operations. Examine manual and CNC lathe turning practices. Utilize tooling, machining practices and applied mathematics. Teamwork, critical thinking, and problem solving are emphasized. Hands-on experience and practical applications.

### RSNM1210 | Manufacturing Careers Investigation | Practicum (3 Credits)

Explore different manufacturing careers through several possible paths. Create resumes, explore job postings, attend a job fair, perform mock interviews and report weekly on your progress. Fulfill the course requirements by completing at least 162 hours in an industry-related internship, co-op or apprenticeship.

**Prerequisite(s):** RSNM1100, RSNM1110, RSNM1120, And RSNM1130

## Social Behavior Science (SBSC)

### SBSC1000 | Cultural Diversity | Lecture (2 Credits)

Explain awareness and understanding, the key elements of cultural diversity; explore the challenges and benefits of diversity; and develop cultural competency to facilitate living and working together in our multicultural society.

**General Education:** Diversity

### SBSC1200 | World Views & Religions | Lecture (3 Credits)

Explore the history and culture of several major world views and religions that continue to shape how people experience and interpret the world. Identify the institutions and their founders; determine the essential teachings, rituals, and sources of authority as well as different interpretations of each. Examine some of the essential differences and similarities which exist among each to develop the ability to think both empathetically and critically about each.

**General Education:** Social Sciences

### SBSC2000 | Religion & Conflict | Lecture (3 Credits)

Introduction to the questions that religion tries to answer and how the major world religions of Hinduism, Buddhism, Judaism, Christianity, and Islam attempt to answer those questions. Analyze the validity of the theory that religion is a major cause of conflict and suffering in the world today compared to other belief systems. Examine how different religions come into conflict with societal norms, expectations, laws, and structures. Summarize religion's unique contributions to society.

**General Education:** Social Sciences

## Social Science (SOC)

### SOC1910 | Social Sciences Topics I | Lecture (1 Credit)

Topics in social sciences selected by faculty assigned to the course.

**General Education:** Social Sciences

### SOC1920 | Social Science Topics II | Lecture (2 Credits)

Focus is on topics in social science selected by faculty assigned to the course.

**General Education:** Social Sciences

### SOC2400 | Sociology of Positive Interactions | Lecture (3 Credits)

Explore the concepts of positive social interactions in your personal environment and their impact on meaningful relationships, individually and within the collective community.

**General Education:** Social Sciences

### SOC2510 | Global Studies | Lecture (2 Credits)

Provides a basic understanding of the socioeconomic, geographic, and political issues of the world.

**General Education:** Diversity

### SOC3100 | Workforce Diversity Issues | Lecture (3 Credits)

Examine theories and practical ideas about diversity in organizations. Explore the historical basis of diversity in the United States, legislation related to diversity and current trends. Characterize the experiences of diverse groups in the areas of race, gender, nationality, age, disability, ethnicity and religion. Identify and practice strategies to overcome conflict in the workplace, as well as reducing discrimination and increasing equality.

**General Education:** Upper Social Sciences

### SOC3910 | Social Behavioral Sciences Topics 1 | Lecture (1 Credit)

Topics in social sciences selected by the faculty assigned to the course.

**General Education:** Upper Social Sciences

## Software Engineering (SENG)

### SENG2100 | Introduction to Computing | Lec/Lab (3 Credits)

Introduction to computer science, software engineering, and the intersection of these fields with each other, other engineering disciplines, and the sciences in general. Historical perspectives on the fields. Ethics, team building, professional communication, and problem solving.

### SENG2200 | Introduction to Software Engineering | Lec/Lab (3 Credits)

Introduction to software engineering as an area of computer science. Focused study of requirements; overview of various modeling techniques applicable to requirements and specifications, including UML and formal modeling.

### SENG2210 | Software Design | Lec/Lab (4 Credits)

Designing software with long-term software quality. Software quality attributes, domain-driven design, software design patterns, and documentation.

**SENG3110 | Software Testing | Lec/Lab (3 Credits)**

Investigate testing methodologies. Tools and techniques in automated testing. Creation of documentation at all stages of testing.

**SENG3120 | Software Process Improvement | Lec/Lab (3 Credits)**

Assessment and improvement of the software development process. Techniques and tools related to each software development life cycle model and stage. Issues include those related to development and maintenance, quality, safety, security assurance, and project management. Quality assurance processes and techniques, ISO9000 and Software Engineering Institute Capability Maturity Model integration.

**SENG3210 | Software Architecture | Lec/Lab (3 Credits)**

Architecture of large-scale software systems. Architectural patterns, software quality, documentation of scenarios. Presentation to management for project funding and go-no go decision making. Reusable component design and development. Explanation to design and development personnel.

**SENG3220 | Software Project Management | Lec/Lab (3 Credits)**

Planning, organization, estimation, risk management. Traditional and emerging software development life cycle models. Tools and techniques for management software projects.

**SENG3230 | Human-Computer Interaction | Lec/Lab (3 Credits)**

Design and evaluate interactive application interfaces, user- and task-centered approaches to design, guidelines for graphical design, interface evaluation techniques, current interface trends, including web interfaces and information visualization. Group projects that include designing, prototyping, and implementing an application interface.

**SENG3300 | Data Introduction | Lec/Lab (3 Credits)**

Accelerated beginning course in data usage and management including language syntax, document model, document types, schemas and stylesheets from EXtensible Markup Language (XML) with a focus on creating structured content and data for business application.? Integration of relational database concepts and design of database management systems for enterprise information needs.? Data modeling with Unified Modeling Language (UML) and Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

**SENG3310 | Database Systems | Lec/Lab (4 Credits)**

Accelerated course in data management. Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas, normalization, data warehouses, data mining, data cubes. Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, and security.

**Prerequisite(s):** SENG3300

**SENG3320 | Database Server Administration | Lec/Lab (3 Credits)**

Administer database technologies and the resources (hardware and software) that are needed to implement the various database systems needed to run an organization at the management level.

**Prerequisite(s):** SENG3310

**SENG4110 | Software Engineering Senior Project I | Lec/Lab (3 Credits)**

End-to-end project exhibiting all skills related to the profession. Focus is on requirements elicitation, scheduling, planning, reviews and postmortem, configuration management, and implementation of the project.

**SENG4210 | Software Engineering Senior Project II | Lec/Lab (3 Credits)**

End-to-end project exhibiting all skills related to the profession. Focus is on requirements elicitation, scheduling, planning, reviews and postmortem, configuration management, and implementation of the project.

**Prerequisite(s):** SENG4110

**SENG4310 | Security I | Practicum (3 Credits)**

Integration of data and users with an emphasis on security will be used in client/server, Internet, intranet/extranet, and other technologies. Review state-of-the-art technologies in each of the basic software and hardware arenas, while emphasizing management models and higher-level analysis using the computer.

**SENG4320 | Security II | Lec/Lab (3 Credits)**

Explore fundamental and emerging concepts of computer security.? Topics include: maintaining information confidentiality, protecting information integrity, assuring information availability, physical, technical, application, and Internet security, social engineering and associated attacks.

## Speech (SPCH)

**SPCH1000 | Speech | Lecture (3 Credits)**

Introduction to public speech making; purpose and organization, audience analysis and response, verbal and non-verbal clues.

**General Education:** Communications

## Surveying & Civil Engineering Technology (SCVL)

**SCVL1001 | Special Topics in Surveying | Directed Study (1 Credit)**

Investigation of a selected topic in various areas of surveying allowing an area of special interest to be further examined. Prerequisite: Proposal and consent of instructor.

**Prerequisite(s):** SCVL1110

**SCVL1110 | Introduction to Surveying | Lec/Lab (4 Credits)**

Introduction to the technical equipment and industry processes used by surveying technicians to collect and interpret data.

**Prerequisite(s):** SCVL1110

**Corequisite(s):** SCVL2240

**SCVL1111 | Introduction to Surveying | Lec/Lab (3 Credits)**

Introduction to the technical equipment and industry processes used by surveying technicians to collect and interpret data.

**SCVL1130 | Legal Descriptions & Boundary Control | Lecture (4 Credits)**

Introduction to property descriptions and land survey systems with a focus on composing and interpreting legal descriptions used in surveys.

**SCVL1210 | Control & Geodetic Surveying | Lec/Lab (4 Credits)**

Examine the fundamentals of Control Surveys, including Global Positioning Systems, focus and its' application to the geospatial industries, as well as an in-depth study of datums and projections.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL1220 | Transportation & Municipal Design | Lec/Lab (4 Credits)**

Utilize the principles of civil design with industry software to create elements of transportation and municipal design.

**Prerequisite(s):** CSBT1001 And CSBT1002

**SCVL1230 | Land Use Planning | Lecture (4 Credits)**

Introduction to the planning process used to develop land with an emphasis on land use for public and private needs in a community.



**SCVL1240 | Professional Development | Seminar (1 Credit)**

Design of the core competencies necessary to succeed in the workforce are implemented in an individualized professional development plan. Engagement in internships, occupational simulation, and other methods of experiential study are integrated and assessed through a 360 process. Emphasis is on career preparation.

**SCVL2000 | Professional Development | Directed Study (2 Credits)**

Develop and implement a customized plan which identifies areas of focus to be a successful graduate. Emphasis is on completion of an internship, professional seminar(s), certification(s), or alternative project.

**Prerequisite(s):** SCVL1110

**SCVL2110 | Materials, Testing, Construction Methods | Lec/Lab (4 Credits)**

Introduction to testing construction materials and methods, inspection and quality control. Examine construction documents to estimate quantities and costs for civil projects.

**SCVL2111 | Materials, Testing, Construction Methods | Lec/Lab (3 Credits)**

Introduction to testing construction materials and methods, inspection and quality control. Examine construction documents to estimate quantities and costs for civil projects.

**SCVL2120 | Utility & Construction Design | Lec/Lab (4 Credits)**

Utilize the principles of civil design with industry software to create elements of utility infrastructure and its' construction.

**Prerequisite(s):** CSBT1001 And CSBT1002

**SCVL2140 | SCVL Topics | Seminar (1 Credit)**

Topics in land surveying and civil engineering presented and examined through lectures, speakers, and field trips to develop an awareness of current trends, issues, and the future of the surveying and civil design industries.

**Prerequisite(s):** CSBT1000

**SCVL2200 | Professional Development | Directed Study (4 Credits)**

Core competencies necessary to succeed in the workforce are designed in an individualized professional development plan. Engagement in internships, occupational simulation, and other methods of experiential study are implemented and assessed through a 360 process. Emphasis is on career preparation.

**SCVL2210 | Laser Scanning & Remote Sensing | Lec/Lab (4 Credits)**

Analyze Laser Scanning and Remote Sensing technology, including the integration of the data to surveying and civil engineering projects.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2240 | Exam Preparation | Seminar (1 Credit)**

Review various categories relevant to certification and licensure exams. Emphasis will be on the topics listed to occur on the exams.

**Prerequisite(s):** SCVL1110, CSBT1000, And SCVL1111

**Corequisite(s):** SCVL1110

**SCVL2250 | Geospatial Technology | Lecture (4 Credits)**

Examine the current state of the Geospatial Industry, including Geographic Information Systems(GIS) and Geospatial products.

**Prerequisite(s):** SCVL1110 And SCVL1111

**SCVL2260 | Site & Subdivision Design | Lec/Lab (4 Credits)**

Utilize the principles of civil design with industry software to create elements of site design, including the design of subdivisions and study of the subdivision process.

**Prerequisite(s):** CSBT1001 And CSBT1002

## Toyota's Technician Trng & Educatn Ntwrk (TTEN)

**TTEN1210 | Dealer Service Systems | Lec/Lab (3 Credits)**

Introduction to dealership systems: repair order writing, dealership management training, and Toyota/Lexus Interactive Networking systems. Emphasis will be on vehicle inspection techniques; utilization of Toyota scan tools in troubleshooting advanced computer controlled vehicles.

**Prerequisite(s):** AUTO1110, AUTO1120, And AUTO1130

**TTEN1220 | Body Electrical Systems | Lec/Lab (4 Credits)**

Theory of operation and diagnostic principles of Toyota/Lexus chassis and body electrical systems. On-vehicle component testing with the latest scan tools, digital multi-meters, lab scopes and factory electrical schematics.

**Prerequisite(s):** TTEN1220

**TTEN1230 | Advanced Brakes & Suspension Systems | Lec/Lab (3 Credits)**

Theory of operation and diagnostic principles of Toyota/Lexus brake/suspension systems. ABS (Anti-lock braking system), traction control systems, advanced steering stability systems, pre-alignment inspections. 4-wheel alignment, suspension and steering systems, component repair and replacement, troubleshooting vibration, noise, and harshness concerns.

**Prerequisite(s):** TTEN1210 And TTEN1220

**TTEN2110 | Drivetrain Systems | Lec/Lab (7 Credits)**

Theory of operation and diagnostic principles of Toyota/Lexus drivetrain systems. Differentials, CV and universal joints, manual transmissions, transfer cases, automatic transmissions. System maintenance, periodic service, and on-vehicle diagnosis. Disassembly, inspection, and assembly of system components. CVT transmission and hybrid transmission.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**TTEN2120 | Heating & Air Conditioning | Lec/Lab (2 Credits)**

Theory of operation and diagnostic principles of Toyota/Lexus air conditioning and heating systems. Refrigeration system service, control system repair, heater service, automatic heating/AC systems, component testing, environmental issues, and troubleshooting the various systems.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**TTEN2131 | TTEN Internship I | Internship (4 Credits)**

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**TTEN2210 | Engine Diagnostics & Repair | Lec/Lab (3 Credits)**

Hands-on repair of the Toyota/Lexus engines. Service procedures include cooling system repair, lubrication system repair, intake systems repair, exhaust repair, engine testing, engine replacement, engine disassembly, cleaning and measurement, cylinder head diagnostics, timing belt/chain replacement 4cyl, 6cyl, 8cyl.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**TTEN2220 | Engine Performance Repair | Lec/Lab (6 Credits)**

Hands-on repair of the Toyota/Lexus fuel and computerized engine control systems. Service procedures include: fuel pressure testing, fuel injector testing, exhaust gas analysis, advanced scan tool usage, and on-vehicle diagnostics. Advanced diagnostics, including hands-on repair of the Toyota/Lexus engine control systems. Service procedures include: on-vehicle diagnostics of Toyota/Lexus including advanced computer control systems, networking communication, emission control systems, and test drive diagnostic techniques.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230



**TEN2231 | TTE Internship II | Internship (4 Credits)**

Cooperative, paid on-the-job training. Preparation providing real life job skills and work habits in a variety of automotive areas.

**Prerequisite(s):** TEN1210, TEN1220, And TEN1230

## Web Development (CDEV)

**CDEV1010 | Introduction to Web Development | Lec/Studio (3 Credits)**

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting and layout. Integration of web scripting languages (like JavaScript) into existing web pages to increase user-friendliness and functionality. Creation of scripts for new pages.

**CDEV1011 | Programming Fundamentals I | Lecture (2 Credits)**

Basic programming principles like data types, variables, expressions, operators, Boolean Logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data structures.

**CDEV1110 | Advanced Programming | Lec/Studio (4 Credits)**

Create windows based applications. High-level, event-driven programming language concepts with an emphasis on user interface. Advanced object-oriented languages.

**CDEV1111 | Programming Fundamentals II | Lecture (2 Credits)**

Object-oriented and event driven-programming. Program construction, software creation problem-solving. Programming structures and coding recipes. Concrete application of concepts using easy-to-use but fully functional programming languages. Visual coding and environments. Game theory including collision and boundary detection. Versioning systems, testing strategies, change management tools.

**CDEV1120 | Data Organization | Lec/Studio (4 Credits)**

Language syntax, document model, document types, schemas and stylesheets from eXtensible Markup Language (XML) with a focus on creating structured content and data for business application. Integration of relational database concepts and design of database management systems for enterprise information needs. Business rules analyzed to diagram data models with Unified Modeling Language (UML). Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

**CDEV2000 | Business Architecture | Lec/Studio (3 Credits)**

Business concepts such as human resource development, marketing, investing, security, legal, and entrepreneurship. Types of businesses including e-commerce, consulting, outsourcing, and training topics. Various development approaches for software development from traditional systems analysis to contemporary agile methods and beyond. Developing models and prototypes to practice the processes and techniques needed to design and build quality software systems.

**CDEV2011 | Business Applications | Lecture (4 Credits)**

Transition of static HTML web sites to complex data integrated applications. Server-side scripting. Difference between coding a page and coding a site or full project. Customization and integration of many complex pieces of code and parts of a web site into a single cohesive web application.

**CDEV2020 | Databases: Philosophy & Practice | Lec/Studio (3 Credits)**

Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, security. Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas.

**CDEV2110 | Web Publishing | Lec/Studio (5 Credits)**

Techniques central to web publishing. Open-source and proprietary languages built for the web. Tools used to publish content online. Interactive, data-driven web applications for web storefronts. Scripting templates, databases, file system, directories and other enterprise systems for developing web application services.

## Web Programming & Database Development (CWEB)

**CWEB1000 | Introduction to Web Languages | Lec/Studio (2 Credits)**

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout.

**CWEB1010 | Introduction to Web Development | Lec/Studio (3 Credits)**

Hypertext Markup Language (HTML). Basic page structure, tags, link, text formatting, forms, tables, and debugging with trouble-shooting skills. Cascading Style Sheets (CSS), advanced formatting, and layout. Integration of web scripting languages (like Javascript) into existing web pages to increase user-friendliness and functionality. Creation of scripts for new pages.

**CWEB1110 | Programming Fundamentals | Lec/Studio (4 Credits)**

Basic programming principles like data types, variables, expressions, operators, Boolean logic, algorithm creation, flowcharts. Structured programming and programming logic constructs (sequence, selection, and loops). Abstraction, modularization, dynamic and static data-structures, object-oriented and event driven programming.

**CWEB1111 | Programming Fundamentals II | Lec/Studio (3 Credits)**

Intermediate programming principles like abstraction, modularization, dynamic and static data-structures, object-oriented and event driven-programming more in-depth. Classes and inheritance. Program construction, software creation problem-solving. Programming structures and coding recipes. Concrete application of concepts using easy-to-use but fully functional programming languages. Visual coding and environments. Game theory including collision and boundary detection.

**Prerequisite(s):** CWEB1110

**CWEB1120 | Data Organization | Lec/Studio (4 Credits)**

Language syntax, document model, document types, schemas and stylesheets from eXtensible Markup Language (XML) with a focus on creating structured content and data for business application. Integration of relational database concepts and design of database management systems for enterprise information needs. Data modeling with Unified Modeling Language (UML) and Structured Query Language (SQL) used for data definition to construct physical databases, for data manipulation and for data computation.

**CWEB2010 | Advanced Programming | Lec/Studio (4 Credits)**

Create windows based applications. High level, event driven programming language concepts with an emphasis on user interface. Advanced object-oriented languages.

**Prerequisite(s):** CWEB1110

**CWEB2011 | Business Applications | Lec/Studio (4 Credits)**

Transition of static hypertext markup language (HTML) web sites to complex data integrated applications. Server-side scripting. Differentiate between coding a page and coding a site or full project. Customize and integrate many complex pieces of code and parts of a web site into a single cohesive web application.

**Prerequisite(s):** CWEB1110

**CWEB2020 | Database Servers | Lec/Studio (3 Credits)**

Database server technology for enterprise-class data services and complex business logic. Server architecture, data integrity, data types, indexing, constraints, stored procedures, database schemas, normalization, data warehouses, data mining, data cubes.

**Prerequisite(s):** CWEB1120

**CWEB2101 | Business Architecture | Lec/Studio (4 Credits)**

Business concepts such as human resource development, marketing, investing, security, legal, and entrepreneurship. Various development approaches for software development from traditional systems analysis to contemporary methods (like Agile) and beyond. Develop models and prototypes to practice the processes and techniques needed to design and build quality software systems.

**CWEB2111 | Web Publishing | Lec/Studio (3 Credits)**

Techniques central to web publishing. Open-source and proprietary languages built for the web. Tools used to publish content online. Interactive, data-driven web applications for web storefronts. Scripting templates, databases, file system, directories and other enterprise systems for developing web application services.

**Prerequisite(s):** CWEB2010

**CWEB2121 | Database Systems | Studio (2 Credits)**

Structured Query Language, database normalization, database management systems (DBMS), implementation-independent database design, and security.

**Prerequisite(s):** CWEB1120

**CWEB2133 | Internship III | Internship (3 Credits)**

Practice skills in an approved, professional, external, commercial entity for a minimum of 162 hours.

**Prerequisite(s):** CWEB1110

**CWEB2135 | Advanced Topics | Capstone (3 Credits)**

Emerging technologies advanced topics. Career preparation work. Perfecting job skills. Resumes, cover letters, interview skills. Portfolio or external project work to exhibit all skills gained throughout program. Seminar/independent study format.

## Welding Technology (WELD)

**WELD1110 | Introduction to Welding Lab | Laboratory (5 Credits)**

Perform welding of standard joint designs on various thicknesses of steel plate. Practice oxyacetylene welding and cutting (OAW), stick welding (SMAW), and wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Demonstrate shop safety, setup and troubleshooting of welding equipment and applications.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1120 WELD1130

**WELD1120 | Introduction to Welding Theory | Lecture (4 Credits)**

Identification, recognition and calculations associated with weld joint designs and weld materials. Examine various weld processes: oxyacetylene welding and cutting (OAW), stick welding (SMAW), wire feed welding (GMAW). Introduction to tungsten inert gas (TIG) welding. Examine shop safety, setup and troubleshooting of welding equipment and applications.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1110 WELD1130

**WELD1130 | Welding Math, Prints & Symbols | Lecture (4 Credits)**

Principles of weld print reading, measuring systems, decimal/fraction conversions, dimensioning, layout, orthographic views, technical math, and section views.

**Prerequisite(s):** TTEN1210, TTEN1220, And TTEN1230

**Corequisite(s):** WELD1110 WELD1120

**WELD1210 | Advanced Welding Lab | Laboratory (5 Credits)**

Practice welding of steel plate and aluminum alloys using stick welding (SMAW), wire feed welding (GMAW) and tungsten inert gas (TIG) welding. Demonstrate shop safety, grinding, finishing, and cutting practices in a final fabrication project.

**Prerequisite(s):** WELD1110

**Corequisite(s):** WELD1221

**WELD1221 | Advanced Welding Theory & Applications | Lecture (8 Credits)**

Identification, recognition, and calculations associated with weld joint designs and assemblies using various welding and metallurgic processes. Other topics include: material selection, layout, fixturing, weldment inspection and lean manufacturing. Culminates in a designed and fabricated project.

**Prerequisite(s):** WELD1120

**Corequisite(s):** WELD1210

## Writing (WRIT)

**WRIT2010 | Technical Writing | Lecture (3 Credits)**

Technical writing applications are studied for format, style, voice, and point of view; considered for purpose, audience, and subject. Critical thinking and developed expertise are employed to analyze, interpret, evaluate, summarize and generate various technical documents, individually and within teams.

**General Education:** Communications

**WRIT4001 | Capstone Writing | Lecture (3 Credits)**

Examine the essentials of writing clearly and efficiently within the framework of argumentative research writing. Formulate a coherent thesis and defend it logically with evidence drawn from research. Practice working through the stages of planning, research, organizing, and revising writing.

**General Education:** Upper Communications

**WRIT4020 | Capstone Technical Writing | Lecture (2 Credits)**

Research, plan, and organize professional documents for the capstone project. Topics include assessment techniques, special audience considerations, professional speaking skills, and presentation aids.

**General Education:** Upper Communications

# ACADEMIC CALENDAR

## Fall Semester 2018

Date	Event
Monday, 8/20/18	Start of fall semester
Friday, 8/24/18	Last day to add/drop a class with a full refund
Monday, 9/3/18	No class – Labor Day (Campus closed)
Monday, 10/15/18 - Friday, 11/2/19	Advising weeks
Monday, 11/5/18	Registration for 19 spring semester & summer session
Thursday, 11/22/18 and Friday, 11/23/18	No class – Thanksgiving (Campus closed)
Monday, 11/26/18	Last day to withdrawal from a class without a grade of F
Friday, 12/21/18	End of fall semester
Monday, 12/24/18 - Friday 1/4/19	Winter Break (Campus reopens 1/2/19)
Friday, 1/4/19	Final grades due to Registrar

## Spring Semester 2019

Date	Event
Monday, 1/7/19	Start of spring semester
Friday, 1/11/19	Last day to add/drop a class with a full refund
Monday, 1/21/19	No class – Martin Luther King, Jr. Day (Campus closed)
Monday, 2/18/19	No class – Presidents' Day (Campus closed)
Monday, 3/4/19 - Friday, 3/29/19	Advising weeks
Monday, 3/11/19 – Friday, 3/15/19	Spring Break
Monday, 4/1/19	Registration for 2019 summer/fall semester
Friday, 4/19/19	No class – Spring Holiday (Campus closed)
Monday, 4/22/19	Last day to withdraw from a class without a grade of F
Tuesday, 4/30/19	Countdown to Commencement for 2018 fall and 2019 spring/summer graduates
Friday, 5/17/19	End of spring semester
Wednesday, 5/22/19	Graduate Reception
Thursday, 5/23/19	2019 Spring Commencement
Friday, 5/24/19	Final grades due to Registrar

## Summer Semester 2019

Date	Event
Monday, 6/3/19	Start of summer session and Arts and Sciences Session I
Friday, 6/7/19	Last day to add/drop a class with a full refund
Friday, 6/28/19	Last day of Arts & Sciences Session I
Thursday, 7/4/19	No class – Independence Day (Campus closed)
Friday, 7/5/19	No class - (Campus closed)

Monday, 7/8/19	Start of Arts & Sciences Session II
Friday, 7/19/19	Last day to withdraw from a class without a grade of F
Friday, 8/2/19	End of summer session and Arts and Sciences Session II
Friday, 8/9/19	Final grades due to Registrar

# ACADEMIC POLICIES

The pages in this section of the catalog will help you understand all of the various policies that relate to your academic standing and experience at Dunwoody.

This includes information on subjects like expectations around attendance, adding/dropping/withdrawing from courses, how your grade point average is calculated, what academic honors are available, and how registration takes place.

Questions regarding these policies may be directed to the Registrar's Office by email at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or by phone at 612-381-3360.

## Attendance Policy

Regular class attendance is critical to student success in the learning process. Students are expected to attend and actively participate in lecture, laboratory, and shop activities as dictated in course syllabi. All instructors will take attendance. Students can view their recorded attendance in my.dunwoody (<http://my.dunwoody.edu>). Absences are closely monitored by the Registrar, Student Affairs, and the Provost's Office. Dunwoody reserves the right to withdraw any student absent for five or more days in a row and/or, as noted above, as dictated in course syllabi.

Reporting missing students: an attempt will be made to establish that a student is missing school of their own accord. If school officials question the safety and well-being of an enrolled student, contact will be made to any known family or friends and contact could be made with the police if deemed appropriate.

## Religious Observances

Students are permitted excused absences for observance of religious holidays under the following conditions and without discrimination.

- There is a scheduling conflict between the scheduled class, lab, or shop time and the religious holiday.
- Student must notify instructors of the upcoming religious holiday within the first 3 weeks of the semester.

Instructors may reschedule the missed academic time before or after the religious observance. Instructors shall accept, at face value, the sincerity of students' religious beliefs.

## Military Deployment

Military students who will be deployed should meet with the Dean of Students, Kelli Sattler (<https://catalog.dunwoody.edu/catalog-student-handbook/academic-policies/attendance-policy/ksattler@dunwoody.edu>), to fill out a Student Request Form (<http://www.dunwoody.edu/pdfs/StudentRequestForm.pdf>) as soon as they know about their deployment. After their request has been approved, students must also notify their academic program manager or dean and current faculty, so academic arrangements can be made.

## Add/Drop/Withdrawal (By Class)

### Add a Class

- A class may be added no later than the first five days of the semester.

### Drop a Class

- A class may be dropped within the first five days of the semester. Students who have not attended the first five days of the semester will be dropped from the class.
- Dropped classes will not appear on a student's transcript and will not have an impact on the GPA.

### Withdraw from a Class

- Students may withdraw from a class during the timeframe between the sixth day of the semester and the end of week 14 (week 7 for summer session).
- The class will remain on the student's transcript with grade of W and will not have an impact on the GPA.
- Students cannot withdraw from a class once a letter grade has been earned

To add, drop, or withdraw from individual courses, students need to see their instructor, academic advisor, or academic program manager/dean to fill out an Add/Drop/Withdraw form. Please contact the Registrar's Office by email at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or by phone at 612-381-3360 with questions.

Courses may be cancelled or modified at the discretion of Dunwoody College of Technology. Students will be notified if enrolled in a cancelled or modified section and a refund may be issued for the course. Students may work with their academic advisor, or academic program manager/dean for registering in another course section.

For information on refunds of dropped or withdrawn classes, please refer to the tuition refund policy in the Tuition, Fee, and Account Information section of this handbook. Be advised that withdrawing from a course may affect a student's financial aid status and award.

## Complete Withdrawal

### Student-Initiated Withdrawal

Students who want to withdraw from all classes must notify their academic program manager/dean, who will submit a Complete Withdrawal form on behalf of the student.

### Institution-Initiated Withdrawal

Dunwoody reserves the right to terminate the enrollment of students. Reasons for termination include, but are not limited to:

- Non-attendance/no contact
- Frequent absences or tardiness
- Academic dishonesty
- Unsatisfactory academic progress and pace (completion) rate
- Aggressive, harassing, or discriminatory acts against other students or employees
- Failure to pay tuition by stated deadlines
- Failure to follow school procedures and policies
- Failure to comply with safety regulations
- Intentional damage to school property or theft
- Insubordinate acts against faculty or other Dunwoody employees

## Date of Withdrawal Determination

The date of official withdrawal is determined through notification by the student of intent to withdraw and/or attendance records showing the last



date the student attended class. The financial aid date for processing the return of funds is the official notification date of withdrawal from the Registrar's Office.

## Enrollment Status

### Enrollment Status

Enrollment status is defined as "enrolled" or "withdrawn" and is determined by the amount of credit hours for which a student is enrolled. Enrollment status is broken down into the following categories:

- Full-time: 12 or more credits
- Three-quarter time: 9-11 credits
- Part-time: 6-8 credits
- Less than part-time: 1-5 credits

The number of credits in which a student is enrolled in determines the amount of financial aid eligibility. Changes in a student's enrollment status may impact financial aid eligibility.

Students enrolled in a minimum of 6 credits may be eligible to participate in some financial assistance programs. Students should always discuss changes in status with a financial aid advisor to determine changes in eligibility and possible consequences.

For more information, contact the Financial Aid Office on financial aid eligibility at [financialaid@dunwoody.edu](mailto:financialaid@dunwoody.edu) or 612-374-5800, or the Registrar's Office at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or 612-381-3360.

### Verification of Student Enrollment Status

Students may obtain an enrollment status certificate by going to Enrollment and Degree Verification on [my.dunwoody](http://my.dunwoody.edu) (<http://my.dunwoody.edu>). Enrollment verifications reflect the student's enrollment information at the time that the verification is requested.

## Registration and Schedules

### Registration for Returning Students

Registration for courses after the first-semester is coordinated by the student's academic advisor and the academic program manager/dean. All registered courses can be viewed via [my.dunwoody](http://my.dunwoody.edu) (<http://my.dunwoody.edu>). Questions regarding registration may be directed to the Registrar's Office at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or 612-381-3360.

To register for classes, students must:

- Visit with their academic advisor and/or academic program manager/dean for a list of classes for which to register
- Have all balances satisfied at the end of the academic term
- Have met all pre-requisite requirements for courses
- Register via [my.dunwoody](http://my.dunwoody.edu) (<https://my.dunwoody.edu>)

## Deployment

Dunwoody will ensure a smooth academic transition for deployed students upon their return to college. Military students who are deployed should meet with Student Affairs and Financial Aid to fill out a Student Request Form (<http://www.dunwoody.edu/pdfs/StudentRequestForm.pdf>). Students must also notify their academic program manager/dean and faculty so academic arrangements can be made.

## Academic Records/FERPA

The Federal Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. Those rights are as follows:

- The right to inspect and review the student's educational record within 45 days of the day the College receives a request for access.
- Students should submit written requests that identify the record(s) they wish to inspect to the Registrar's Office. The Registrar's Office will make arrangements for access and notify the student of the time and place where the records may be inspected.
- The right to request amendment of the student's educational records that the student believes are inaccurate or misleading. Students may ask the College to amend a record that they believe is inaccurate, misleading, or in violation of the privacy rights of the student. To do so, they should submit a written request. If the College decides not to amend the record as requested by the student, the College will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.
- The right to consent to disclosure of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.

Some of the more common exceptions are as follows:

- Disclosure to school officials with legitimate educational interests.
- A school official is a person employed by the College in an administrative, supervisory, academic, research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the College has contracted (such as attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an educational record in order to fulfill his or her professional responsibility.
- Disclosure for transfer purposes.
- Upon request, the College may disclose educational records without consent to officials of another school in which a student intends to enroll.
- Disclosures to parents of dependent children.
- A student is considered a dependent student if they can be claimed as a dependent on the tax return of a parent, guardian, or other individual. However, the College will check with the student before releasing information to parents or guardians.
- The right to file a complaint with the U.S. Department of Education concerning alleged failures by the College to comply with the requirements of FERPA. The name and address of the office that administers FERPA is:

Family Policy Compliance Office  
U.S. Department of Education  
400 Maryland Ave. S.W.  
Washington, D.C. 20202-5920

## Notification of Directory Information

The Family Educational Rights and Privacy Act (FERPA), a Federal law, requires that Dunwoody College of Technology, with certain exceptions, obtain written consent prior to the disclosure of personally identifiable information from education records. However, Dunwoody College of Technology may disclose appropriately designated "directory information" without written consent, unless you have advised the College to the contrary in accordance with the institution's procedures.

Directory information, which is information that is generally not considered harmful or an invasion of privacy if released, can also be disclosed to outside organizations without a parent's prior written consent.

If you do not want Dunwoody College of Technology to disclose any or all of the types of information designated below as directory information from your education records without your prior written consent, you may notify the Registrar's Office by completing a Consent to Release Education Records.

Dunwoody has designated the following information as directory information:

- Name
- Address (local, permanent, and electronic mail)
- Telephone numbers
- Hometown
- Dates of attendance
- Enrollment status (full-time, part-time, or not enrolled)
- Program of study
- Degrees and awards received and where received
- Most recent educational institution attended
- Photographic, electronic, or video images if the student has consented to release. These images include student participating in officially organized events.

## Grading System and SAP

### Midterm and Final Grades

Midterm grades are used by some faculty for advising purposes, but do not appear on transcripts. Midterm and final grades can be viewed at my.dunwoody (<http://my.dunwoody.edu>).

### Grading System

The College uses a traditional four point grading scale. Grade Point Average (GPA) is determined cumulatively and for each semester of enrollment. All GPA information is found on a student's transcript. Cumulative GPA must be 2.0 or above for students to remain in good standing.

### Calculating Grade Point Average (GPA)

The GPA is computed by multiplying the grade value by the number of credits to determine "quality points" for each class and then dividing the total quality points by the total number of credits.

Here is an example of a GPA calculation:

- 3-credit course x 4 points (grade of "A") = 12.00 quality points
- 4-credit course x 3.33 points (grade of "B+") = 13.32 quality points
- 4-credit course x 2 points (grade of "C") = 8.00 quality points

Totals: 11 credits divided into 33.32 quality points = 3.03 GPA

The following shows the letter grade and corresponding quality point.

- A = 4.00
- A- = 3.67
- B+ = 3.33
- B = 3.00
- B- = 2.67
- C+ = 2.33
- C = 2.00
- C- = 1.67
- D+ = 1.33
- D = 1.00
- D- = 0.67

INC = 0.00 Incomplete calculated as F in GPA

TR = Transfer – Not calculated in GPA yet will affect pace rate

CR = Credit Given – Not calculated in GPA

W = Withdrawn – Not calculated in GPA yet will affect pace rate

AU = Audit – Not calculated in GPA and will not affect pace rate

\* = Grade value not calculated in GPA under current academic plan yet will affect pace rate

NCR = No Credit Given – Not calculated in GPA

[ ] = Bracketed grade indicates repeat

TO = Test Out – Not calculated in GPA and will not affect pace rate

### The "F" Grade

Students failed to meet course requirements, receive an "F" grade. A student who fails a course must repeat the course or may request to complete alternate course requirements, as available. If a failed course is retaken and passed, the new grade will supersede the previous grade and be counted toward the GPA. Both the failed and retaken courses will count toward the pace rate calculation.

### The "W" Grade

A "W" grade means a student has withdrawn from a course after the add/drop period. No credit is awarded for the course, but it does count as credits attempted and toward the pace rate calculation. Grades of W may impact financial aid eligibility.

### The "[ ]" Grade

When a course is repeated, both grades will show on the transcript but only the highest grade will be used in computing (GPA). The repeated grades appear in brackets. Financial aid will apply to the courses repeated when the original grade was passing (D- or above). Repeat courses may be eligible for financial aid. Only those grades with quality points in the above list will be used in computing a student's GPA.

### The "\*" Grade

A grade followed by an asterisk (\*) symbol denotes a grade earned for a course that is no longer relevant to the current academic plan in place. Grades of W will not be asterisked. Please note that these courses will count toward the pace rate calculation.

### The "AU" Grade

Registration for a course without credit (AU grade) carries the same tuition and fees as courses taken for credit. You must consult with the course instructor concerning audit requirements and submit a Student Request form with the instructor's signature to the Registrar's Office during the first five days of the semester or the first three days of summer session. Once you have registered you cannot earn a letter grade. A

course you have previously audited may be re-taken later for credit and a letter grade.

### **The “INC” Grade**

A grade of incomplete may be issued if a student encounters extenuating circumstances that prevent the student from completing course requirements by the end of the course duration. Extenuating circumstances may include illness, military orders, or other circumstances deemed appropriate by the instructor. The purpose of the incomplete is to grant an extended period of time that will be agreed upon by the academic program manager/dean. In order to be eligible for an incomplete grade, a minimum of 75 percent of the course’s academic requirements must be successfully completed by the student at the time that the request is filed.

### **INC (Incomplete) Process**

To request an incomplete, students are required to meet with the instructor to discuss whether an incomplete grade is appropriate for their situation. If the instructor approves the student’s request for an incomplete, the instructor may request an Incomplete form from the Registrar’s Office. The form must be completed with the date in which all requirements must be met, along with the signatures of the student, instructor, and program manager/dean. Once the form is received by the Registrar’s Office, the incomplete will be tracked for completion and the form will be added to the student’s record. After the deadline for work to be completed has passed, the instructor will complete a grade change form with the updated grade and submit to the Registrar’s Office for processing. The new grade will be recalculated into the GPA and will affect a student’s Satisfactory Academic Progress.

### **Grade Appeals**

A student who believes a final course grade is inaccurate or unfair should proceed as follows:

1. Consult with the instructor to fully understand the grounds and procedures used to determine the final course grade. The goal of this conversation is to reach mutual understanding about the criteria, assessment, and the final course grade assigned and, if necessary, to correct any errors.
2. If there is no resolution after the conversation with the instructor or the instructor is not available for the initial conversation, the student should contact the program manager or dean.
3. If a resolution is not reached through steps one and two, the student should submit a written petition to the Office of the Dean of Students. This appeal must be submitted no later than 45 calendar days after the beginning of the next semester following the term in which the final grade in dispute was recorded. The Dean of Students will provide a resolution in writing within 15 business days of the appeal.

## **Satisfactory Academic Progress (Statutory)**

### **Introduction and Purpose of the Policy**

Dunwoody College of Technology, consistent with federal and state law, requires that a student, regardless of tuition payment source, enrollment status, or program of study, make satisfactory academic progress toward a degree or certificate in order to receive financial aid and attend classes. The definition of satisfactory academic progress is defined in federal and state law and includes a consideration of the student’s grade point average and the pace with which the student is moving through the program. Dunwoody applies those definitions in this policy. A student is

responsible for ensuring that they are progressing in their field of study and needs to access student support services, such as tutoring and the Writing Center, when they are feeling challenged.

### **Definition and Standards of Satisfactory Academic Progress**

#### **Grade Point Average**

To maintain satisfactory academic progress standards, students are to meet or exceed a cumulative grade point average (GPA) of 2.0.

#### **Pace/Completion Rate**

The student must meet or exceed the minimum cumulative pace (completion) rate of 67%. This means that the student must successfully complete 67% of the courses that they have attempted. The Pace Rate is calculated using the following formula.

Cumulative number of credit hours successfully completed  
(including accepted transfer credits and prior Dunwoody courses)

Pace =

Cumulative number of attempted credit hours (including accepted transfer credits and prior Dunwoody courses)

Grades of NCR, W, F, and INC in a course will negatively impact pace rate, in that the course will be considered a course taken but not an earned credit. Credits attempted in other programs at Dunwoody will impact the pace rate, as well.

#### **Maximum Timeframe to Receive Financial Aid**

A student receiving financial aid must complete their program of study within 150% of the program’s published total credits. Transfer credits are included in this calculation. Once the 150% plateau is reached the student no longer can receive financial aid. The student must also be aware that any time during a student’s academic experience at Dunwoody, if it is determined that it will be mathematically impossible for the student to complete a program of study within the 150% timeframe, Dunwoody is required to make the student ineligible for financial aid and must inform the student of their ineligibility.

#### **Frequency of Evaluation**

Satisfactory Academic Progress is evaluated for every student by Student Affairs at the conclusion of each semester.

### **Course Completion Used in Calculating Academic Progress**

The calculation of Grade Point Average and Pace is undertaken with the first class taken. All courses are cumulatively included in the calculation whether the student received financial aid or not.

#### **Attempted Credits**

Credits in which the student is enrolled at the end of the semester’s drop period.

#### **Cumulative Attempted Credits**

Total number of credits for which the student has been registered at Dunwoody, regardless of the program and regardless of whether the student received financial aid.

#### **Credits Successfully Completed**

Credits counted toward the degree or certificate. The student has successfully completed the requirements of the course as defined by the program and course syllabus. Grades indicating passing and calculated into the GPA are; A, A-, B+, B, B-, C+, C, C-, D+, D, D-. A grade of CR (Credit

Given) will not be included in the GPA calculation but will positively affect pace.

### **Credits Not Successfully Completed**

Credits attempted but not successfully completed and as such will not be counted toward the degree or certificate. The student has not successfully completed the requirements of the course as defined by the program and course syllabus. Grades indicating non-successful completion include F, W, INC. A grade of NCR (No Credit Given) will not be included in the GPA calculation but will negatively affect pace.

### **Repeating an F Course**

A student who fails a course must repeat the course or may request to complete alternate course requirements, as available. If a failed course is retaken and passed, the new grade will supersede the previous grade and be counted toward the GPA. Both the failed and retaken course will count toward the pace rate calculation.

## **Other Course Types and Transcript Indications and Implications on GPA and or Pace**

### **Audit Courses (AU)**

Audit courses are not eligible for financial aid. The audited courses will not be calculated into the GPA and will not affect the pace rate.

### **Credit Given (CR)**

A credit given classification is most often used for internships and clinical experiences. The CR grade will not be included in the calculation of the GPA but it will positively impact pace.

### **Incomplete (INC)**

For courses where the student has not completed the course requirements and the instructor has provided the student with additional time to complete the course, the grade indication incomplete or INC is used. If the student does not complete the work in the time indicated by the instructor, the grade converts to an F. The F grade will impact the student's GPA and pace rate.

### **No Credit Given (NCR)**

A no credit given classification is most often used for internships and clinical experiences. The NCR grade will not be included in the calculation of the GPA but it will negatively impact pace.

### **Transfer (TR)**

Courses transferred into the program of study from another higher education institution. These courses are not calculated into the GPA but do affect the pace rate.

### **Withdrawn (W)**

The student has withdrawn from a course after the add/drop period. There is no impact on the student's GPA. The course is counted as attempted credits and as such affects the pace rate. W grades may impact financial aid eligibility.

### **Change of Major**

Students wishing to change their curriculum (major) must fill out a Change of Curriculum form, available in the Registrar's Office. The form must be approved by the appropriate program manager/ dean. A new academic plan will be assigned. Grade values earned in courses that no longer apply to the new major or award level in place will be removed from GPA calculations and noted on the transcript with an \* following the grade. However, the actual letter grade earned for all courses taken will remain on the transcript. From the transferred grades a new cumulative GPA will be determined. Please note that all attempted Dunwoody courses will be included in the pace calculation, that means all credits

taken under all majors will be included in the maximum attempted credits and the calculation of credits attempted and earned.

### **Summer Courses**

Students wishing to take courses in the summer term, the credits taken in the summer will be included in the maximum attempted credits and the calculation of credits attempted and earned.

### **Concurrent Programs of Study**

Students wishing to pursue two avenues of study at the same time, the credits taken under all majors will be included in the calculation of the GPA as well as the maximum attempted credits and the calculation of the credits attempted and earned. The maximum timeframe rule for completion of 150% will still apply with the rule based upon the longer of the programs.

## **When Satisfactory Academic Progress Standards are Not Met**

### **Academic Warning**

Evaluation of satisfactory academic progress is conducted by Student Affairs at the end of each semester. If it is found that the student's cumulative GPA has fallen below 2.0 or pace rate below 67%, the student will be placed on academic warning.

### **Notification**

- The Office of the Dean of Students will alert students by U.S. Mail and Dunwoody email to their academic warning once all final grades have been submitted for the previous semester.
- Included in this notification will be the information on the student's current status in regard to Satisfactory Academic Progress and the *Academic/Pace Warning Success Plan form*.

### **Financial Aid Under Warning Status**

- A student placed on Academic Warning will have one semester of financial aid to bring their status into compliance with the definition of satisfactory academic progress, both GPA and pace.

### **Academic Warning Process**

- A student placed on Academic Warning will be encouraged to complete an *Academic Warning Success Plan form* with their program manager/dean and the Associate Dean of Students. The Academic Warning Success Plan will be developed with the student's academic dean/manager and outline the steps the student needs to take to successfully meet the satisfactory academic progress standards by the end of the warning semester. Forms will be sent with the notification but can also be obtained at the Registrar's Office.

### **Evaluation at the Conclusion of the Academic Warning Semester**

- At the conclusion of the Academic Warning Semester if the student now meets both the GPA and pace standards, the warning status will end and the student will again be placed in good standing.
- If at the conclusion of the Academic Warning semester the student still does not meet the GPA and pace standards, the student will be on academic suspension and will not be eligible for Title IV financial aid programs or State of Minnesota programs.
  - Consideration will also be given to the student's ability to meet the satisfactory academic progress standards within the maximum timeframe standard of 150%.



## Financial Aid Suspended

As stated above, financial aid (Title IV and State) will be suspended if the student does not meet the GPA and pace standards.

### Notification

- The Office of the Dean of Students will alert students by U.S. Mail and Dunwoody email to their financial aid suspension once all final grades have been submitted for the previous semester.
- Included in this notification will be the information on the student's current status, their right to appeal, the appeal process, and the Academic/Pace Probation Appeal form which includes the Academic Plan.

### Student Appeal Process

A student who does not attain the satisfactory academic standard has the right to appeal the determination. In order to execute the appeal, the student needs to complete the following elements. A student will have two weeks (14 days) from receiving the notification to complete a SAP appeal.

1. Obtain an *Academic/Pace Probation Appeal form*. This was included in the notification but can also be obtained in the Registrar's Office.
2. The student needs to make an appointment with the program manager/dean and Associate Dean of Students.
3. With the program manager/dean, the student will develop an Academic Plan including courses to be taken and resources to be accessed by the student to meet the Satisfactory Academic Progress standard. Consideration has to be given as to whether the student can meet the standards and also meet the maximum timeframe (150%) to receive financial aid.
4. With the Associate Dean of Students, the student will review the Academic Plan and identify any further resources that may benefit the student's success.
5. Students should complete the form and set-up an appointment with the Dean of Students to discuss the appeal.

### Appeal Determination

The Dean of Students will make a determination on accepting or denying the appeal within ten days. Elements taken into consideration regarding the appeal include:

- The student's GPA and pace rate
- The student's grades
- Compliance with the Academic Warning Success Plan
- Overall attendance in the previous semester
- Student rationale for lack of compliance and plan for future compliance
- Academic Plan and the ability to meet the plan along with the maximum time frame to receive financial aid (150%)
- Recommendations of the department

### Appeal Approval/Denial

The Dean of Students can approve or deny the appeal. The Dean of Students will alert students by U.S. Mail and Dunwoody email of the Dean of Students determination.

- If the appeal is approved, the student's financial aid eligibility will be reinstated and the student will be placed on Academic Probation and expected to complete the Academic Plan. The student's registration status will then be converted to Academic Probation Appeal Approved (APAA).

- If the appeal is denied, the student's enrollment will be involuntarily terminated and all monies paid to the school for the new semester will be refunded.

### Academic Probation

A student, who has successfully appealed their Satisfactory Academic Progress financial aid suspension, will move forward and execute the Academic Plan. The first semester of the plan is the probationary term. The student's performance at the end of the semester will be evaluated to determine the student's progress.

- If the student has met the Satisfactory Academic Progress standards, the student will return to good standing.
- If the student has not met the Satisfactory Academic Progress standards, but has met the standards established in their Academic Plan the Academic Probation Appeal Approved (APAA) status will continue and be evaluated at the end of the next semester.
- If the student has not met the Satisfactory Academic Progress standard and has not met the standards established in their Academic Plan, the student's financial aid will be suspended.

### Reinstatement

A student, who has had their financial aid suspended/ terminated as defined in the processes outlined above and has not exceeded/or assured to exceed the 150% completion rate, can appeal for reinstatement of their financial aid and ability to enroll at Dunwoody College of Technology. The student will be counseled as to the reinstatement appeal process at the time that financial aid is suspended/terminated. **It must be understood that there is no guarantee that the student who undertakes an appeal will be reinstated into Dunwoody or to receiving financial aid.**

Conditions under which this appeal can be submitted include:

- All appeals must be made in writing and submitted to the Dean of Students. The Dean of Students will make a determination on accepting or denying the appeal within ten days. Conditions under which the student will be reinstated will be determined by the Dean of Students should the appeal be approved.
- Subsequent to financial aid suspension/termination at Dunwoody, the student has attended another institution of higher learning and demonstrated academic success in one or more courses which can be transferred back into the Dunwoody programmatic academic plan. A student who seeks to pursue the appeal process needs to work closely with Dunwoody to ensure that the courses they are going to enroll in at another institution will be transferrable to Dunwoody and to identify how the successful completion and transfer of the courses would affect their Satisfactory Academic Progress status at Dunwoody. Official transcripts for these courses must be submitted as part of the appeal documentation.
- Consideration will be made as to what has changed in the student's situation that now affords them the ability to succeed.
- Above all, the student will have to demonstrate that they meet Dunwoody's Satisfactory Academic Progress Policy and that they are eligible for federal financial aid.

It should be noted, that neither the student paying for their own classes at Dunwoody nor the student sitting out a term will affect the student's academic progress status, so neither is sufficient to establish eligibility.

# Graduation

## Graduation Requirements

In order to graduate with a certificate or degree program from Dunwoody College of Technology, students must meet all of the following graduation requirements:

- Complete all courses listed under the degree requirements on the academic plan that the student was assigned
- Maintain a minimum cumulative grade point average of 2.0

## Graduation Diplomas and Transcripts

Degrees are processed approximately six to eight weeks following the end of term. Diplomas will then be mailed to graduates who have fulfilled all financial obligations and returned all college property (laptops, library materials, etc.).

## Graduation (Commencement)

The Ceremony occurs at the end of or after spring semester. Graduate participation in Commencement is encouraged, but not required. Participating in Commencement is not an indication of official graduate status.

For questions please contact the Registrar's Office at registrar@dunwoody.edu or 612-381-3360.

## Graduation Fee

The graduation fee is a one-time, non-refundable fee of \$50. It defrays the costs of processing graduates for graduation, printing and mailing diplomas, printing diploma covers, the cap and gown worn at commencement, and other expenses associated with graduation.

Students will be billed the \$50 graduation fee by the Student Account's Office when the student begins the last term of their program. The fee will be applied as a charge to the students' accounts and billed along with any other outstanding expenses students may owe to Dunwoody. Please note that any changes to a student's expected graduation date may impact the assessment of this charge. Please contact Student Accounts at studentaccounts@dunwoody.edu or by phone at 312-381-3414.

## Awards and Honors

Dunwoody College of Technology recognizes student achievement in several ways:

### Attendance Award

The Alumni Board of Managers has chosen to recognize graduating Bachelor degree, Associate of Applied Science degree, and Certificate students who have maintained excellent attendance with an Attendance Award. Students' attendance is tracked and tallied at the end of their academic program. Calculations are based on the total number of hours a student attends class. The award will be given to students for the following achievements:

- 100% Attendance
- Outstanding Attendance (98% attendance or higher)

## Dean's List

The Dean's List, compiled after each term, lists Bachelor degree, Associate of Applied Science degree, and Certificate students whose grade point average for a term is 3.5 or better (term GPA). Students must be enrolled in school full-time, (a minimum of 12 credits), graded on the traditional grading system, and have no incompletes in courses offered for credit. Students on the Dean's List are given a letter of recognition and publicly recognized on the campus website — unless full FERPA restriction is in place. Dean's List achievement is not awarded retroactively (an INC grade made up at a later date will not be retroactively applied to the Dean's List award date).

## Latin Honors

Dunwoody recognizes outstanding academic achievement by awarding Latin honors for students seeking a Bachelor degree or an Associate of Applied Science degree at graduation. Honors are based on cumulative grade point average. The categories recognized are:

- Summa Cum Laude: a cumulative grade point average of 3.90 or better
- Magna Cum Laude: a cumulative grade point average of 3.70 to 3.89
- Cum Laude: a cumulative grade point average of 3.50 to 3.69

Students who qualify for recognition the semester before graduation will have honors noted by their name in the graduation program and wear honor cords at the commencement to mark their achievement. However, such honors will not be validated until all final grades are calculated.

## Student Leadership Award

The Dunwoody Alumni Association's Board of Managers gives its annual Student Leadership Award to a graduating student or students who exemplify leadership, scholastic excellence, community service, and school spirit.

Qualifications:

- Minimum GPA of 3.0
- Completed three years of a Dunwoody Baccalaureate program, one year of a two-year program, or one semester of a one-year program
- Recommended by faculty or staff
- Exemplary leadership ability, scholastic excellence, community service, and school spirit

## Academic Excellence Award

The Academic Excellence Award is given to one graduating student from each academic department. Nominees are selected by faculty members and must have 90% attendance or higher and a GPA of 3.0 or higher. Additional criteria are: a solid work ethic, extra-curricular participation, collegiate camaraderie, pursuit of excellence, and self-awareness.

## Ignite Award

Ignite is an online publication showcasing student work nominated for the Peggy DeVries Excellence Award. This award has been established by the Arts & Sciences department to recognize and reward outstanding work in creative writing, expository writing, multimedia presentations, and art. The goal of this award and online publication is to nurture the imaginative and creative efforts of students.

## The Student Global Citizen Award (GCA)

The Student Global Citizen Award is given to a Dunwoody student whose accomplishments exemplify enthusiastic awareness of issues related to working and living successfully in our diverse society. The recipient of this award is recognized for organizing, volunteering for, and/or participating in a number of diversity-related activities within Dunwoody and the broader community.

## Posthumous Degree Policy

Dunwoody College may grant degrees posthumously. A deceased student who did not complete all requirements for their degree at the time of death may be awarded a degree posthumously provided the following conditions are met:

### Requirements:

- The student was within 20 credits (6.0 units) of completing all requirements for his/her degree.
- The student was in good academic standing with the institution at the time of death. Good standing is defined as not being academically deficient for their classification (academic probation, continued probation, suspension or expulsion).
- The student was enrolled at the time of death or their continuous enrollment was interrupted by their injury, illness, deployment, etc.

*\* If the individual does not meet the above requirements, the decision to move forward with the nomination process is at the discretion of the provost.*

### Nomination/Approval Process:

- Anybody may identify a candidate for a posthumous degree, but such a suggestion must be made to the dean or program manager of the appropriate academic department for consideration and to begin the formal process.
- The student's degree audit file shall be obtained from the Registrar to verify program and progress toward degree completion.
- The dean or program manager will recommend the candidate for a posthumous degree in the form of a formal written request to the Provost. The provost may choose to present this to the Academic Dean's Council for review/discussion.
- If supported by the Academic Dean's Council and provost, the provost will submit the recommendation to the president for formal approval.

# ADMISSIONS

## Admissions Office

The Admissions Office is here to help you explore if Dunwoody is the right fit for you. Feel free to reach out for information on:

- Campus tours and Open Houses
- Academic majors/programs
- How to apply
- Financial aid and scholarships
- Career exploration and alumni success (<https://dunwoody.edu/campus-life/campus-services/career-services>)

For details, visit: [dunwoody.edu/admission-aid/admissions](https://dunwoody.edu/admission-aid/admissions).

### Contact:

Dunwoody College Admissions  
818 Dunwoody Blvd.  
Minneapolis, MN 55403  
[admissions@dunwoody.edu](mailto:admissions@dunwoody.edu)  
612-374-5800

## Admission Requirements

### Admissions Requirements

Students applying for admission to Dunwoody College of Technology must provide a final, official high school transcript (with graduation date) or a GED score from a recognized GED testing center. If the student has completed college credits and the student wishes to have the credits considered for transfer, an official transcript from that institution of higher learning is also required.

Admission decisions are based on a careful, overall assessment of each student's academic preparation and performance as well as the additional information provided in the application. Although the strongest consideration in the decision is given to the primary factors listed below, no single factor is the deciding factor in the decision.

#### Primary factors:

- Coursework through high school graduation
- Performance in previous college-level coursework (if applicable)
- Grade Point Average
- ACT, SAT, or PSAT scores (if available)

#### Secondary factors:

- Outstanding talent, achievement, or aptitude in a particular area
- Military service
- Evidence of having overcome social, economic, or physical barriers to educational achievement
- Significant responsibility in a family, community, job, or activity

## Diploma Verification

All students accepted for admission into Dunwoody College of Technology are required to provide the Admissions Office with either:

- A final, official high school transcript (with a graduation date)
- A GED score from a recognized GED testing center

#### Acceptable Formats:

- Students may request that their school mail an official transcript directly to Dunwoody (Dunwoody must receive the transcript in a sealed envelope).
- Dunwoody will accept faxed transcripts if the fax is directly from the high school.
- Students may bring a transcript directly to Dunwoody; it is only acceptable if given to Dunwoody Admissions personnel in a sealed envelope.
- Electronic transcripts sent through a verified agency.

Dunwoody checks each transcript for the school seal and/or signature to determine if the transcript is official.

### Tracking schools without a CEEB (College Entrance Examination Board Code)

- A transcript received without a CEEB code will need to be reviewed by the Director of Admissions to determine if the school is recognized by the Department of Education.
- Dunwoody may also check the appropriate regional accrediting commissions in the United States.
- If it is determined that a school is not recognized by the Department of Education or has no physical address, then that applicant will be required to submit a GED prior to evaluation their application.

### Home schooled students

Homeschools issue their own transcripts and diplomas. The Minnesota Department of Education does not certify or validate these. Homeschool transcripts issued by the educator must contain the following:

- Courses
- Graduation date
- Cumulative GPA
- ACT or SAT scores are recommended International students:

Generally, a certified translated transcript and a transcript in the original language is required. Students who, for any reason, are unable to present us with an official transcript from their home country are required to take the GED.

### Ability to Benefit

To be eligible for financial aid funds, a student must be qualified to study at the postsecondary level as required by the Higher Education Amendments of 1992 (Ability to Benefit-ATB criteria).

Dunwoody uses the following criteria to determine qualification and ability to benefit:

- A student with an official high school diploma/transcript or its equivalent.
- Recognized alternative equivalents are a General Education Development (GED) certificate, certificate of homeschool completion (through the high school level), or a postsecondary accredited academic transcript with at least 60 credit hours.



## Program Level Admissions Requirements:

### Electrical Engineering (EENG) and Mechanical Engineering (MENG)

- 3.0 or higher high school GPA
- 22 composite ACT score with a 22 math subscore or 1110 composite SAT score with a 515 math subscore
- Completion of mathematics coursework through Pre-calculus

### Software Engineering (SENG)

- 3.0 or higher high school GPA
- 22 composite ACT score with a 22 math subscore or 1020 composite SAT score with a 515 math subscore
- Completion of mathematics coursework through Pre-calculus
- Four years of English and completion of chemistry and physics courses preferred.

## Admitted Students

## Admitted Students

Dunwoody College of Technology is committed to helping you succeed. From providing academic support and advising during the school year, to lifelong employment assistance when you are ready to enter the workforce, our faculty and staff are here to help. Our campus environment includes collaborative places for you to study and interact with peers; and amenities such as lockers and parking are provided to students at no charge.

Please take a minute to familiarize yourself with all of the campus services and support available to you as a Dunwoody student. Additional information is available online at [dunwoody.edu/campus-life/campus-services](https://dunwoody.edu/campus-life/campus-services) (<https://dunwoody.edu/campus-life/campus-services>).

## Orientation

Orientation provides a quality transitional experience and maximizes the students' potential for personal and academic success. Orientation is an enrollment requirement for all new students.

Admitted students will be mailed additional information on Orientation sessions. During orientation, students:

- Receive their class schedule and copy of transfer credit evaluation form if applicable
- Receive their school I.D. badge and parking permit
- Meet with their department dean and faculty
- Review Dunwoody expectations and policies
- Learn about student clubs and organizations

## New Student Day

Every newly admitted student is required to attend New Student Day held the week prior to each semester start. During New Student Day, students participate in a number of program-specific activities that will introduce them to their field, career preparation, and support academic success. New Student Day is the unofficial "first day" of the academic program and is mandatory for all students. Information on specific dates will be sent to all new students during the summer.

## Registration for New Students

Registration is the process of enrolling in courses. The Registrar's Office processes first-semester registration for students once they are accepted to Dunwoody. The College uses a cohort-model of registration. A cohort-model is defined as a pre-determined grouping of courses, designed

to build knowledge from a foundational basis and continue advanced knowledge building, as one progresses through each course. Students are only registered for the courses required by their major. Students will receive a paper copy of their schedule at Orientation and can view their schedule via [my.dunwoody.edu](https://my.dunwoody.edu). For questions please contact the Registrar's Office by email at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or by phone at 612-381-3360.

## Academic Advising

Every Dunwoody student is assigned both an academic and Student Services advisor. The academic and Student Services advisor answers academic questions and helps the student to meet all of the requirements needed for graduation. Students are encouraged to meet with their advisors at least once a term. Student Affairs also provides non-academic advising such as time management, procrastination, personal/social issues on topics, and inclusion vs. isolation.

## Lockers

Lockers are available to students at no cost, on a first-come, first-served basis. Locker assignments may be obtained throughout the year in the Multicultural Center. Be sure to bring your Dunwoody ID card.

## International Students

International applicants must fulfill the following requirements before a decision can be made on their application to attend Dunwoody College of Technology.

Application Checklist:

- Completed application
- Transcripts
  - Applicants who have not attended ANY college or university courses must submit all high school or secondary school transcripts and certificates and/or diplomas.
  - Transfer applicants must submit all college and/or university transcripts, in addition to the above.
  - Photocopies are acceptable for application. However, students are required to present official / final copies of their transcripts and certificates before registering for classes.
- Writing sample
  - Please explain why you would be an excellent candidate for acceptance at Dunwoody College. Also please explain how you decided on your career choice and why that led you to Dunwoody.
- Copy of the photo/information page of your passport.
- Proof of financial capability / financial certification form:
  - U.S. Department of Homeland Security regulations require the university maintain records showing you have met its financial requirements. You are responsible for demonstrating you have sufficient funds to meet all education and personal expenses for the duration of your F-1 status at the college. This means you must provide proof you have at least the amount necessary to cover your tuition, fees, living and personal expenses for your first academic year (nine months). Note: If you attend a summer session and/or bring your spouse or other dependents with you to the United States, you must certify you have the additional funding necessary to cover the additional costs.
  - Bank Statements/Financial Documentation: Official proof of funding cannot be more than 3 months old at the time of application and funding needs to be in liquid assets only. Funds do not need to be in U.S. dollars. The documentation of funding (for applicant, family member & individual sponsor)

must be on original bank letterhead stationery with a signature of a bank official in ink. A photocopy of a bank statement, savings account statement or certificate of deposit will also be accepted if it is stamped by the issuing bank in original stamp ink and has a signature of a bank official in ink. An English translation by an official translating agency may be necessary.

If so, please provide this along with the documentation you submit. All financial documentation must be received before your immigration paperwork can be issued.

- Financial Certification Form: If funding will be provided by a family member or individual sponsor, their signature is required on the bottom of this form. If a signature cannot be obtained on this form, a signed letter from the family member and/or individual sponsor is required. The letter must include your name, the family member or individual sponsor's name, the amount the family member or individual sponsor is willing to fund per year, and the length of time the funding will be available.
- Optional scholarship submissions
- SEVIS transfer form/immigration documentation
  - Applicants already inside the U.S. must submit a copy of their current VISA.
  - Applicants already inside the U.S. on a J-1 VISA must submit a copy of their most recent DS2019 form.
  - Applicants transferring an F-1 VISA from another U.S. school must submit a copy of their most recent I-20 form and a SEVIS Transfer Form.
- English proficiency: All international applicants whose native language is not English must provide proof of English proficiency at the appropriate level for college study. Below are the requirements and options for meeting this requirement.
  - Score reports must be sent to Dunwoody College of Technology **directly from the testing center.**
  - Score reports must not be more than 2 years old.
  - Score reports must be official and meet one of the options below.
    - **TOEFL** (*Test of English as a Foreign Language*) score report of 65 on the Internet Based TOEFL (iBT) with a subscore of 20 on the written and 20 on the speaking sections.
    - **IELTS** (<http://www.ielts.org>) (*International English Language Testing System*) score report of 6.5.
    - **MELAB** (<http://www.lsa.umich.edu/eli/testing/melab>) (*Michigan English Language Assessment Battery*) minimum score report of 77, and score report must be accompanied by an official letter from the testing coordinator.
    - **SAT** (<http://sat.collegeboard.com>) critical reading score of 450.
    - **ACT** (<http://www.actstudent.org>) English score of 19.
    - **IB** (<http://www.ibo.org>) (*International Baccalaureate*) Higher Level English score of 4.
    - **AP** (<http://www.collegeboard.com/student/testing/ap/about.html>) (*College Entrance Examination Board Advanced Placement*) examination in English Literature/Composition score of 4.
    - ELS Language Center (<http://www.els.edu/stpaul>) successful completion of Level 112 with a CGPA of 2.0 or above, and with the recommendation of academic director.
    - Bachelor degree from an accredited U.S. college or university (*not an online degree*).

- Transfer of 28 credits or more from an accredited U.S. college or university, with the transfer equivalent of UST English 121 and English 206, with a grade of B or above in the course transfer, and with a CGPA of 2.75 or above. Transfer of one semester or more from an accredited U.S. college or university with a CGPA of 2.75 or above, and testing out of the ELS Language Center (<http://www.els.edu/stpaul>) college placement exam.

## Re-Admittance

Any student wishing to withdraw from school should visit with the Admissions Department to determine if and when re-admittance to the College is feasible. Students who leave Dunwoody for personal, family, work, and similar reasons are encouraged to re-apply for a future term.

Students who wish to be re-admitted should submit a re-admit application. A student being re-admitted would need to follow the academic plan currently in place which may be different from the academic plan in place at the time the student initially withdrew.

## Previous Unpaid Balances

Students wishing to re-admit to Dunwoody who have a financial hold on their account from the time of withdrawing from school must resolve the outstanding balances before being re-admitted and registered for classes. The Student Account's Office should be consulted for assistance with resolving the debt.

## Previous Academic/Pace Standing

Students wishing to re-admit to Dunwoody must meet with an program manager/dean and The Dean of Students prior to admittance to determine how their previous academic or pace standing may impact their registration. All re-admitted students will be subject to the current academic/pace requirements as defined in the satisfactory academic progress portion of this Catalog/Student Handbook.

## Transfer Students & Transfer Credit

Dunwoody welcomes students who have completed prior coursework from an accredited institution. If you'd like to transfer into one of our certificate or degree programs, please note that a transfer evaluation is required and not all credits may transfer into the degree program.

In addition, Dunwoody's bachelor completion degree programs have specific admissions requirements. These are:

### Architecture (BARCH)

- Associate's degree in Architecture
- 3.0 or higher overall college GPA
- Minimum of 20 general education credits
- Individual transcript evaluation
- Interview with program faculty
- Approval from academic program manager

### Business Management & Leadership (AMGT)

- Have an AAS degree (or equivalent)
- Be a Minnesota resident
- Be able to provide a resume and letter of recommendation
- Have access to a computer and internet as most classes are delivered in a distance learning modality (i.e., live web casting)

Those interested in the MIS concentration must also have a background in Information Technology.

### **Computer Systems Analysis (BCSA)**

- Completion of an AAS degree in an Information Technology (IT)-related program
- Approval from academic program dean

### **Construction Management (CMGT)**

- Completion of an AAS degree or equivalent coursework from an accredited institution
- Interview with a principal instructor of academic program manager

### **Electrical Engineering (EENG)**

- 3.0 or higher overall college GPA
- Completion of mathematics coursework through Pre-calculus

### **Industrial Engineering Technology (IENG)**

- 45 technical credits at the lower division level
- 20 general education elective credits at the lower division level, in the following categories:
  - Math/Natural Sciences (minimum of 2 credits)
  - Communications (minimum of 2 credits)
  - Humanities (minimum of 2 credits)
  - Social Sciences (minimum of 2 credits)
  - General Electives (minimum of 12 credits)
- 3.0 or higher overall college GPA
  - Note: Students with a GPA between 2.5 - 2.9 are eligible to start in Industrial Engineering Technology (IENG), but must achieve a GPA of 3.0 upon completion of the first 9 credits of IENG technical coursework (i.e., any courses that start with 'IENG').

### **Mechanical Engineering (MENG)**

- 3.0 or higher overall college GPA
- Completion of mathematics coursework through Calculus II

### **Software Engineering (SENG)**

- 3.0 or higher overall college GPA

## **Transfer Credit**

### **Transferring in Credits and/or Experience**

There are two primary categories of which a student may satisfy program requirements through prior learning. Traditional college- transfer of courses or through non-traditional methods such as test-out or prior learning experience.

#### **Traditional Transfer Credit**

Dunwoody may accept course credits from other regionally or nationally accredited higher education institutions. Only course work earned at the institution issuing the official transcript will be evaluated. Courses will be considered for transfer if the course is comparable in nature, content, and level to a course offered by Dunwoody. Upper division credit transfer can only be accepted if courses were in upper division at the previous institution. Transfer evaluations done by other institutions are not accepted.

Experiential Learning such as study abroad, independent study, workshops, field experience, and internships may or may not transfer, depending on the level and the comparability of the learning experience.

In order to be awarded a degree from Dunwoody College of Technology, a student must take at a minimum 45% of the total technical credits (major requirements) for their major field of study at Dunwoody. Total technical credits transferred in a student's major field cannot exceed 55% of those required for the major. Courses transferred in should reflect the attainment of lower level technical competencies while higher level competencies should be attained at Dunwoody.

The Registrar's Office evaluates official transcripts for potential transfer credits. Students may be asked to provide a syllabus listing the course description and competencies of coursework.

Some Dunwoody programs are considered competitive for enrollment. These programs have specific requirements for transfer. Transfer credits are granted at the discretion of the Registrar's Office and academic program manager/dean.

#### **Health Sciences**

The minimum grade for transfer coursework is a grade of C except for the following: Biology and Anatomy and Physiology for Health Sciences programs need to have a minimum grade of B.

Only these specific credits taken within the last five years will be reviewed: Technical, Health-care-specific biology, anatomy and physiology. Technical transfer credits for the Radiologic Technology degree will not be accepted.

#### **Computer Technology**

Only software-specific classes taken within the past 5 years will be reviewed.

#### **Automotive**

Technical transfer credits for any of the Automotive Programs, from a non- National Automotive Technicians Education Foundation (NATEF) accredited Post-Secondary Automotive program will not be accepted.

Technical transfer credits for any of the Automotive Programs, from an Automotive Technicians Education Foundation (NATEF) accredited Post-Secondary Automotive program will be reviewed on a case by case basis given the following criteria; Minimum grade for transfer coursework is a grade of B. Transfer course work must have been completed within the last 3 years. Experiential Learning credits, such as field experience, or internships will not be accepted.

Testing Out of any technical courses within the Automotive Program will not be allowed.

#### **Procedure**

Students may send official transcripts from all previously attended colleges to:

Dunwoody College of Technology  
ATTN: Admissions  
818 Dunwoody Blvd.  
Minneapolis, MN 55403

Students will be notified of their evaluation via their Dunwoody email address. Students may view the transfer credits on their Academic Plan and Dunwoody transcript at my.dunwoody (<http://my.dunwoody.edu>). Transfer courses will have a grade of TR. Transfer credits will not be

computed into cumulative GPA; however, they will impact student's Satisfactory Academic Progress pace for completion.

If students wish to appeal the evaluation, please contact the Registrar's Office by email at [registrar@dunwoody.edu](mailto:registrar@dunwoody.edu) or by phone at 612-381-3360.

For more information on transfers and transfer evaluations, visit: [dunwoody.edu/campus-life/campus-services/registrar/transfer-information](https://dunwoody.edu/campus-life/campus-services/registrar/transfer-information) (<https://dunwoody.edu/campus-life/campus-services/registrar/transfer-information>)

## Transferring Credit from Another Institution to Dunwoody

Students may enroll in classes at another institution while enrolled in a program at Dunwoody. However, if a student wishes to transfer credit to Dunwoody, they must complete a Permission to Transfer Credits form, and submit it along with supporting documentation of the course. The Registrar's Office will determine whether a course is transferrable or not. Students are expected to submit official transcripts to the Registrar's Office upon completion of the course.

## International Transcripts

International transcript evaluation follows all previous requirements as well as the below requirements:

- The institution at which the student earned course credit and the course for which transfer is under consideration must be reviewed and approved by an international credential evaluator such as World Education Services (WES) [wes.org](http://wes.org) (<http://wes.org>) and Educational Credential Evaluators Inc. (ECE) [ece.org](http://ece.org) (<http://ece.org>).
- The evaluation is done at the student's expense.
- The student must obtain and furnish to the College an official evaluation (course-by-course report) completed by the international credential evaluator.

## Non-Traditional Military Service Credit

Courses completed during military service, with American Council on Education (ACE) credit recommendations, may be eligible for transfer credit. Veteran and military students may provide an official transcript for evaluation. Transcripts can be requested from the below websites:

- Army, Sailor/Marine and Coast Guard: <https://jst.doded.mil>
- Air Force: <https://www.airuniversity.af.mil/Barnes/CCAF/>
- Veterans (Army, Navy, Marine Corps, Coast Guard served prior to 1976) and Air Force served prior to 1972): <https://www.archives.gov/veterans/military-service-records>

## Credit by Examination

Dunwoody may accept credits by examination to fulfill course requirements. The following types of exams may be reviewed:

- Advanced Placement Testing (AP)
- College Level Examination Program (CLEP)
- American College Testing Program (ACT)
- Practical Engagement Program (PEP)
- DANTES Subject Standardized Test (DSST)

Dunwoody's Bachelor of Science in Applied Management and Leadership, including all concentrations, will accept credits from CLEP Tests. These

test credits are not available to students enrolled in AAS, non-bachelor's programs, or other bachelor's programs.

Credits may be accepted based on the following conditions:

- Credit will not be given in courses that are equivalent to credits already granted (i.e. if the student has credit for a communications course, he/she may not receive credit for any communication or equivalent tests).
- Students cannot use CLEP tests to substitute for a course taken at Dunwoody that resulted in a failed grade.
- A maximum of 18 semester credits may be obtained through CLEP Testing. These credits will show up on the student's transcript as CR and will not count in the calculation of the student's GPA but will impact student's Satisfactory Academic Progress pace for completion.

Students must complete CLEP testing at an official test center. Official test centers may be found by going to [clep.collegeboard.org/test-center-search](http://clep.collegeboard.org/test-center-search) (<http://clep.collegeboard.org>).

Once the student completes the test, he/she must supply Dunwoody with score verification (this can be done through the CLEP testing agency), verifying successful completion. In order to receive credit for the test, the student must have a score of 50 or higher (scaled score value). The number of credits that will be granted per test will be determined by the Dean of Applied Management. This determination will be made at the time the student discusses the courses of which a CLEP test may be applicable.

## Credit for Previous Training or Experience

Prior Learning Assessment (PLA) is college level-credit given for prior learning and based on work and/or life experience. Competencies are evaluated based on the recommendation of the American Council on Education (ACE) and National Program on Non-Colligate Sponsored Instruction (PONSI).

This learning/experience can come from prior formal education, examination, and practical experience. The focus on PLA is to evaluate the competencies gained by the student and is not credit given simply for experience. Dunwoody uses PLA criteria developed by The Council for Adult and Experiential Learning (CAEL), which identifies PLA as being:

- Measurable
- College level in terms of learning and achievement (as defined by faculty)
- Able to show a knowledge base
- Current and relevant
- Able to show theoretical and/or conceptual knowledge, in addition to practical knowledge and understanding
- Not repeating or duplicating learning for which credit has already been given CAEL guidelines recognize the granting of credit at several levels:
  - Program level (i.e. general business, management concepts)
  - Individual course level (as identified by competency attainment stated in course syllabi and descriptions)

PLA must meet the following standards (Whitaker, 2006):

- Credit will be awarded only for learning and not for experience
- College credit will be awarded only for college-level learning

- Credit will be awarded for learning that has a balance appropriate to the subject, between theory and practical application
- Subject matter/academic experts will make competence levels and credit awards
- Credit will be appropriate to the academic context in which it is accepted
- Credit awards and transcript entries will be monitored to avoid duplicating credit
- Fees charged for assessment are based on services, not on credits
- Personnel involved in assessment will be adequately trained
- Assessment programs will be monitored, reviewed, evaluated, and approved PLA may be accessed through:
  - Examination
  - Competency demonstration
  - Institutional assessment

### **Test Out of Math Courses**

Students have the opportunity to test out of one or all of the math classes in their academic plan. Students may take this test out at any time. There is no deadline; however, they are advised to not wait until the last semester.

- If the student or the instructor believes that the student can test out, the student should e-mail Eeris Fritz [efritz@dunwoody.edu](mailto:efritz@dunwoody.edu) ([efritz@dunwoody.edu](mailto:efritz@dunwoody.edu))
- They must provide the course number and name of the course
- Eeris will contact them and provide a review and guide them through the test out process

Students are allowed one attempt to pass the test out exam with an 83% or better test score.

### **For the first week of the semester**

If students who register a math class want to test out of the math class, they must drop the math class within the first 5 days of the class or incur cost of class. Students could be offered on the first day of class a short assessment to determine if they could test out.

### **Transferring Credits to Another School**

Dunwoody's regional accreditation facilitates acceptance and transfer of credits to another college or university. Final decisions concerning the acceptance of credits by other institutions; however, are made at the discretion of the receiving institution.



# FINANCIAL AID AND STUDENT ACCOUNTS

The Financial Aid Office is here to help you navigate the world of financial aid, including the FAFSA. Contact Financial Aid at [financialaid@dunwoody.edu](mailto:financialaid@dunwoody.edu) or 612.374.5800.

The Student Accounts Office works with you on paying your tuition and fees and can also help you with financial literacy and planning. Contact Student Accounts at [studentaccounts@dunwoody.edu](mailto:studentaccounts@dunwoody.edu) or 612.381.3414.

More information on paying for college:

- Types of financial aid (<https://dunwoody.edu/admission-aid/tuition-aid/types-of-financial-aid>)
- How to apply for financial aid (<https://dunwoody.edu/admission-aid/tuition-aid/apply-financial-aid>)
- Scholarships (<https://dunwoody.edu/admission-aid/scholarships>)
- Paying your bill (<https://dunwoody.edu/admission-aid/tuition-aid/paying-your-bill>)
- Financial Aid Office website (<https://dunwoody.edu/campus-life/campus-services/financial-aid>)
- Student Accounts Office website (<https://dunwoody.edu/campus-life/campus-services/student-accounts>)

## Financial Information

### Outside Resource/Funds

The Financial Aid Office must be notified of any outside resources or funding that a student receives. This includes outside scholarships. Please contact Financial Aid with questions.

### Scholarships

Dunwoody's Financial Aid Office has internal scholarships that they award to students. To be considered for these scholarships students must complete the FAFSA form. If awarded, students must submit a Thank You Letter to the Financial Aid Office by the appropriated deadline before the funds can be applied towards a student's balance.

### Veteran Benefits

Students who receive veteran's benefits are responsible for any books they charge to their account as well as any charges that are not covered by VA benefits and/or Yellow Ribbon. For more on veteran benefits and financial aid, visit the Veteran & Military Student website (<https://dunwoody.edu/campus-life/campus-services/veteran-military>).

## How Drug Convictions Affect Financial Aid Eligibility

A federal or state drug conviction (but not a local or municipal conviction) can disqualify a student for FSA funds.

Convictions only count against a student for aid eligibility purposes (FAFSA question 23c) if they were for an offense that occurred during a period of enrollment for which the student was receiving federal student aid—they do not count if the offense was not during such a period, unless the student was denied federal benefits for drug trafficking by a federal or state judge (see drug abuse hold sidebar). Also, a conviction that was

reversed, set aside, or removed from the student's record does not count, nor does one received when she was a juvenile, unless she was tried as an adult.

The chart below illustrates the period of ineligibility for FSA funds, depending on whether the conviction was for sale or possession and whether the student had previous offenses. A conviction for sale of drugs includes convictions for conspiring to sell drugs.

Conviction	Possession of Illegal Drugs	Sale of Illegal Drugs
1st Offense	1 year from date of conviction	2 years from date of conviction
2nd Offense	2 years from date of conviction	Indefinite period
3+ Offenses	Indefinite period	Indefinite period

A student regains eligibility the day after the period of ineligibility ends (i.e., for a 1st or 2nd offense); or when he or she successfully completes a qualified drug rehabilitation program that includes passing two unannounced drug tests given by such a program. Further drug convictions will make him ineligible again.

Students denied eligibility for an indefinite period can regain eligibility after completing any of the following options: 1) Successfully completing a rehabilitation program, as described below, which includes passing two unannounced drug tests from such a program; 2) Having the conviction reversed, set aside, or removed from the student's record so that fewer than two convictions for sale or three convictions for possession remain on the record; or 3) Successfully completing two unannounced drug tests which are part of a rehab program (the student does not need to complete the rest of the program). In such cases, the nature and dates of the remaining convictions will determine when the student regains eligibility.

Please contact the Financial Aid Office with any questions regarding this information at [financialaid@dunwoody.edu](mailto:financialaid@dunwoody.edu) or 612.374.5800.

## Financial Responsibility

### Returned Payments/Failed Payments

If a payment made to a student account is returned by the bank for any reason, students agree to repay the original amount of the payment plus a returned payment fee of \$40. Multiple returned payments and/or failure to comply with the terms of any payment plan or agreement signed with the College may result in a requirement of the entire balance being due prior to the semester starting, cancellation of classes, and/or suspension of eligibility to register for future classes at the College.

### Financial Responsibility

All students enrolled at Dunwoody College of Technology are required to complete the Financial Responsibility Form annually.

This form states that students understand that when registered for any class at the College or receive any service from the College, he/she accepts full responsibility to pay all tuition, fees, and other associated costs assessed as a result of his/her registration and/or receipt of services. Students must also further understand and agree that registration and acceptance of these terms constitutes a promissory note agreement (i.e. a financial obligation in the form of an educational loan as defined by the U.S. Bankruptcy Code at 11 U.S.C. §523(a)(8) in

which the College is providing educational services, deferring some or all of payment obligations for those services, and a promise to pay for all assessed tuition, fees, and other associated costs by the published or assigned due date or enrollment in the institutional payment plan.).

Furthermore, understanding that failure to attend class or receive a Billing Statement (bill) does not absolve any student of financial responsibility as described above.

## Communication

The College uses the assigned Dunwoody email as an official method of communication with students. Students are responsible for reading the emails sent from the College on a timely basis. Students authorize the College and its agents and contractors to contact them at the current and any future cellular phone number(s), email address(es), or wireless device(s) on file with the College regarding delinquent student account(s)/loan(s), any other debt owed to the College, or to receive general information from the College. Students authorize the College and its agents and contractors to use automated telephone dialing equipment, artificial or pre-recorded voice or text messages, and personal calls and emails in their efforts to contact them. Students may withdraw consent to call cellular phone by submitting a request in writing to the Student Accounts Office or in writing to the applicable contractor or agent contacting the student on behalf of the College.

Once a Return to Title IV calculation is completed, students are notified by letter of any post withdrawal disbursements, balance due to school, and/or loan repayment requirements.

Updating contact information: Students understand and agree that they are responsible for keeping the College records up-to-date with current physical addresses, email addresses, and phone numbers by updating my.dunwoody (<http://my.dunwoody.edu>). Upon leaving the College for any reason, it is the student's responsibility to provide the College and student loan provider(s) with updated contact information for purposes of continued communication regarding any amounts owed to the College or lenders.

## Late Admittance

Students who wish to attend Dunwoody and are accepted or re-admitted within 14 calendar days prior to the start of the term through the first week of the semester are required to meet with the Financial Aid Office and the Student Accounts Office prior to attending any classes.

Additionally, these students are required to adhere to the the College payment policy as outlined on the Financial Responsibility Form. Late-admit students must also have a completed FAFSA (if eligible) on file with the Financial Aid Office or they must make a payment no less than 25% of the outstanding balance owed for the semester.

If returning students have no means to pay the tuition in full by the end of the sixth business day of the semester (new students have until end of week 2), the student will have the option to leave Dunwoody and have all tuition and fee charges reversed off his or her account. Students will still be responsible for non-returned IT equipment and books and supplies charged to the account.

All tuition and fees must be paid in full prior to the end of the semester. All students with account balances will be placed on a financial hold. Financial holds will prevent release of any transcripts or readmission into the College until the financial obligation has been met.

## Past Due Balance

Financial hold: Failure to pay a bill or any money owed to the College by the scheduled due date, the College will place a financial-hold on the student account, preventing registration for future classes, requesting transcripts, or receiving diploma until the account is satisfied in full.

Students who pay a past due balance with a personal check must wait seven business days for the payment to clear before being allowed to request transcripts, diploma, or register for a new semester.

## Delinquent Account/Collections

Balances remaining after exiting enrollment at the College must be paid in full immediately upon leaving or a payment plan agreement must be set up with the Student Accounts Office. The payment plan agreement is at the discretion of the Student Accounts Office and will have a maximum time period of 12 months. Payments must be a minimum of \$50 per month and must begin within 90 days of leaving the College or incurring the charges. Balances not paid in full within the payment plan parameters or missed payments will result in the delinquent account being referred to a third party collection agency. The delinquency date reported to the agency will be the date the account became delinquent or last day of enrollment, whichever is later. Accounts with a balance of \$600 or less will remain at the College and will result in a financial hold placed on the account preventing registration for future classes, requesting transcripts, or receiving diploma until the account is satisfied in full.

Collection agency fees: For any balance over \$600 owed to the College by the scheduled due date(s), and failure to make acceptable payment arrangements to bring account current, the College will refer the delinquent account to a third party collection agency. The student is responsible for paying the collection agency fee, which may be based on the maximum amount permitted by applicable law, but not to exceed 34% of my delinquent account, together with all costs and expenses, including reasonable attorney's fees, necessary for the collection of my delinquent account. The College will use the social security number for external credit reporting to one or more of the national credit bureaus and/or for collection purposes for all charges incurred against this account.

## Returning After Previous Balance in Collections or Balance Discharged in Bankruptcy

Students who wish to return to Dunwoody after previously attending and having a tuition and fee balance sent to collections or a balance that was discharged in a Chapter 7 or 13 bankruptcy must:

- Satisfy balance owed with the collection agency (this includes any fees related to the account being placed with that agency, if applicable).
- Must meet with the Financial Aid Office and the Student Accounts Office prior to re-admittance.
- Must have all financial aid requirements met prior to attending, if applicable.
- Must show how they will cover 100% of their tuition and fees before being allowed to register. This could include, but is not limited to, a combination of eligible financial aid, non-Dunwoody scholarships, approved and certified private alternative loans, cash, check, credit card, third party payment, or enroll in the Dunwoody Payment Plan.

## Failure to Return Laptop

Students who fail to return the College-issued laptop by the last day of the semester or the last day of attendance/academical-related activity will be placed on the Laptop Recovery List. Students will have a laptop-not-returned hold applied in addition to an \$1,800 laptop-not returned fee. If a student returns the College laptop to the IT Helpdesk within 90 days of leaving the College the \$1,800 fee will be adjusted per the return fee schedule below:

Days	Refund Amount
0-30	\$1,800
31-60	\$1,750
61-90	\$1,700
91+	\$1,200

If the College laptop is returned after the IT lease agreement with the vendor has expired the student will be responsible for the entire \$1,800 laptop-not-returned fee. Dunwoody leases the laptops through a third party leasing company and does not have the right to transfer ownership of the machine to anyone. All machines must be returned regardless of paying the non-returned laptop fee.

In the event that Dunwoody receives possession of the laptop through means other than the student (i.e. returned by law enforcement due to negligence, strangers, pawn shops, etc) will prohibit the student from being able to receive a replacement device. The student will be financially responsible for reimbursing Dunwoody for any fees related to regaining possession.

## Refunds

### Tuition Refund

Dunwoody participates in the U.S. Department of Education Student Aid programs and the Minnesota Financial Aid Program and complies with federal and state regulations which require the College to have a fair and equitable refund policy. Institutional refund calculations are based on one of the following policies:

Refunds for students who withdraw from a course or courses (but not complete withdrawal) during the first five school days of the semester will receive a 100% refund for the course. There is no refund for courses withdrawn after day five.

### Minnesota State Grant

The amount of a MN State Grant that a student may be eligible for has a different value available for each number of credits enrolled. For example: the same student may qualify for \$856 if enrolling in 15 credits but only \$604 if enrolled for 14 credits. Students who are considering reducing their schedule during the drop/add period to less than 15 credits are strongly encouraged to visit the Financial Aid Office for information about how awards may be impacted.

### Complete Withdrawal From All Courses

Under federal law, Dunwoody must calculate a Return of Title IV Funds for students receiving federal financial aid which includes the Pell Grant, SEOG, Subsidized Direct Loan, Unsubsidized Direct Loan, and Parent Direct PLUS Loan. Although those funds, upon disbursement, are applied in full to a student's account, the student earns his or her Title IV funds by attending classes and may be required to return all or a portion of those funds upon withdrawing from all courses. The amount earned

by a student has no relationship to the student's incurred institutional charges.

- **Date of Withdrawal Determination**

The date of official withdrawal is determined through notification by the student of intent to withdraw and/or attendance records showing the last date the student attended class or completed academically related activity. The financial aid date for processing the return of funds is the official notification date of withdrawal from the Registrar's Office.

- **Student Initiated Withdrawal:** Students who want to withdraw from all classes must notify their academic program manager/dean, who will submit a Complete Withdrawal form on behalf of the student.
- **Institution Initiated Withdrawal:** Dunwoody reserves the right to terminate the enrollment of students. Reasons for termination include, but are not limited to: non-attendance/no contact; frequent absences or tardiness; academic dishonesty; unsatisfactory academic progress and pace (completion) rate; aggressive, harassing, or discriminatory acts against other students or employees; failure to pay tuition by stated deadlines; failure to follow school procedures and policies; intentional damage to school property or theft, insubordinate acts against faculty or other Dunwoody employees. The withdrawal date used will be the last date of academic attendance or academically related activity. The date of determination (notification date) will be within 14 days of the withdrawal date.
- **Unofficial Withdrawal:** If a student does not complete the withdrawal process but is absent for 14 days, they will be withdrawn from the college. The withdrawal date used will be the last date of academic attendance or academically related activity.

- **The Federal Pro Rate Refund Calculation**

If the student has attended less than 60% of a term, a pro rate schedule is used to determine the amount of Title IV funds the student has earned at the time of withdrawal based on the number of days attended. If the student has attended 60% or more of a term, the student is considered to have earned 100% of the Title IV funds.

- **Example:** Student attends 44 days of a 124 day term, the student will have earned 35.5% of their Title IV aid. This would result in a return of \$208 of a \$2908 Pell grant disbursement. This same example would lead to all funds distributed from the Subsidized and Unsubsidized loans being returned.

- **Refund calculation**

Dunwoody's Financial Aid Office will divide the number of calendar days attended by the total number of calendar days in the semester, less any scheduled break of 5 days or more. The resulting percentage will then be multiplied by the total federal funds that were disbursed. This calculation determines the amount of aid that the student is allowed to keep. The unearned amount of aid is returned to the federal government. If in this calculation the student is required to return funds due to funds already disbursed (overpayment), the student will be notified. The calculation is completed within 30 days of the notification date with all funds being returned within a 45 day maximum time period.

- **Total Federal Fund Calculation** – In this calculation the total amount of Federal Pell Grant will be included, the net for Direct Subsidized Loans, Direct Unsubsidized Loans and Direct Parent PLUS Loans. Federal Work Study will not be included in the return calculation.
- **Late Arriving Funds** – If a student withdrew during a subsequent payment period, and aid for a previous payment period is

received, the funds are not included in the return calculation. Late disbursements may be made if the conditions for those disbursements are met.

- **Post-Withdrawal Disbursements** – If a student withdrew before all Title IV aid was disbursed, the student may be eligible for a post-withdrawal disbursement. The amount will be determined by following the requirements for calculating earned Title IV aid and has no relationship to the student's incurred institutional charges. Any post-withdrawal disbursements will be made from available grant funds before available loan funds. A school is permitted to credit a student's account with the post-withdrawal disbursements of grant funds without permission from the student up to the amount of outstanding charges. In the case of post-withdrawal disbursements from federal loans funds, confirmation will be obtained from the student before any funds are disbursed. The information provided in the notification will include the information necessary for the student, or parent for a Direct Parent PLUS Loan, to make an information decision as to whether the student or parent would like to accept any disbursement of loan funds and will be provided within 30 days of the date of determination that the student withdrew.
- Based on this calculation, a withdrawing student may owe larger payback to Title IV fund sources than what is calculated as the institutional refund amount. Dunwoody is required by law to make these paybacks to the appropriate Title IV program, so the student may owe money to the College after all refunds and returns are calculated.
- In the case of prolonged illness or accident, death in the family, or other serious circumstances that make it impractical to complete the program, the student should contact the Office of the Dean of Students as soon as possible to initiate discussion on the return of financial aid funds.
- The date of withdrawal determination is explained further on page 45 of this handbook.

## Refund Calculation

Dunwoody provides tuition and fee refunds based on the following chart and process:

- Determine the tuition and fee refund percentage (Find the refund percentage from the following chart):

### Fall and Spring Semesters (18 weeks)

Semesters	Refund Percentage
Week 1	100%
Week 2	75%
Week 3	50%
Week 4	40%
Week 5	30%
Week 6-18	0%

### Summer Session (9 weeks)

Semesters	Refund Percentage
Week 1	100%
Week 2	75%

Week 3	50%
Weeks 4-9	0%

- Students new to Dunwoody who completely withdraw by the end of week two, will be eligible to receive a full tuition refund.
- To compute amount of refund, multiply the net tuition, technology fee, learning technology fee and activity fee by the refund percent.
- Subtract an administrative fee (the lesser of \$100 or 10% of tuition) from the calculated refund to get the net amount of refund.

The above percentages were derived by determining the amount of time spent attending classes.

## Timeline for Processing Refunds

Any monies due to an applicant or student will be refunded within 30 business days of cancellation, failure to appear on the first day of class, dropping classes within the first five days of the semester, complete withdrawal, or termination. All financial aid must be fully refunded before any refund can be made to the student.

## Distribution of Refunds and Repayments

For federal financial aid, the calculation multiplies the percentage by the total federal funds that were disbursed (either to the student's Dunwoody account or directly by check) for the semester. This calculation determines the amount of aid that the student is allowed to keep. The unearned amount of aid must be returned to the federal government.

Refunds on behalf of Student Financial Assistance (SFA) recipients are distributed in the following order:

1. Unsubsidized Direct Loan
2. Subsidized Direct Loan
3. PLUS Direct Loan
4. Federal Pell Grant
5. Federal SEOG
6. Other SFA Programs

After required financial aid adjustments are made to all financial aid sources, any money owed to Dunwoody including unpaid tuition and fees and materials will be billed to the student.

## Federal Loan Default

Federal loan default will keep students from receiving any financial aid until the default has been resolved. Students who are in default on their federal student loans must clear any defaults on the federal loans and provide proof of such before being allowed to enroll at the College regardless of the intended payment method.

## MN Office of Higher Education Refund Calculation

### Introduction and Purpose of the Policy

Dunwoody College of Technology, consistent with federal and state law, will calculate refunds for all state financial aid programs when a student completely withdraws from school, or for the MN State Grant and SELF Loan programs, if the student drops below minimum enrollment level for those programs. This calculation is to be used by schools charging students by the term or payment period. (Note: Refunds are never required for the State Work-Study Program).

## Determining Amount of Net Refund

1. Amount of financial aid and cash received to date for the term including any post-withdrawal disbursements of Title IV financial aid applied to institution charges. If funds exceed the original institutional charges<sup>1</sup> for the term, enter the amount of original institutional charges only.
2. Subtract amount of original institution charges for the term the school can retain per its institutional policy.
3. = GROSS REFUND  
If gross refund is less than or equal to zero, then no refund is due state financial aid programs.
4. Subtract amount of institutional share of any required refund for Title IV financial aid programs from Step 5, Box O of Return of Title IV Funds Refund Worksheet. Enter 0 if no Title IV refund is due.
5. = NET REFUND  
If net refund is less than or equal to zero, then no refund is due state financial aid programs.

<sup>1</sup> The state adopts the definition of institution charges used for federal Title IV aid programs under 484B of the Higher Education Act of 1965 as amended and 35 CFR 668.22.

## Determining Proportional Share of Net Refund for Distribution to Non-Title IV Aid Programs

All non-Title IV financial aid that is received to date during the student's program, and for the current aid year, including any funds disbursed to the student for living expenses will be included in the refund calculation when a student totally withdraws from school. These funds can include state funds, institutional and private scholarships, or any other forms of non-Title IV aid. Work-Study awards are not included.

## Return of Tuition Assistance

Military Tuition Assistance (TA) is awarded to a student under the assumption that the student will attend school for the entire period for which the assistance is awarded. When a student withdraws, the student may no longer be eligible for the full amount of TA funds originally awarded. To comply with the new Department of Defense policy, Dunwoody will return unearned TA funds on a prorated basis through at least 60% portion of the period for which the funds were provided. TA funds are earned proportionally during an enrollment period, with unearned funds returned based on when a student stops attending.

### Fall and Spring Semesters (18 Weeks)

Semesters	Refund Percentage
Week 1-2	100%
Week 3-4	75%
Week 5-9	50%
Week 10-11	40%
Week 12-18	0%

### Summer Session (9 Weeks)

Semesters	Refund Percentage
Week 1	100%
Week 2	75%
Week 3-4	50%
Week 5-6	40%
Week 7-9	0%

## Third Party Funding and Reimbursement

Any student who receives third party funding that is not a reimbursement should work with the Accounting Department and provide the appropriate documentation so the third party can be billed for the approved expenses. Students are responsible for any expenses not covered by the third party (i.e. Device fee, learning technology fee, course materials, books charged to the student account, etc.)

Any student who receives third party reimbursement are required to pay the balance by the published due dates. Balances not paid in accordance with the tuition and fees policy are subjected to late and default fees. Students who receive reimbursement from a third party must pay their balance at Dunwoody by the published due dates and request reimbursement from the third party to reimburse themselves, not the school. Balances not paid by the due dates are subject to late and default fees.



# STUDENT LEADERSHIP AND ENGAGEMENT

Student leadership and engagement is driven by the mission of Dunwoody College of Technology. "Dunwoody changes lives by building opportunities for graduates to have successful careers, to develop into leaders and entrepreneurs, and to engage in "the better performance of life's duties." The policies and procedures within this section lay the ground work for our Student Organizations that focus on the development of our students into leaders.

## Student Organizations

Dunwoody College of Technology and the Office of Student Life encourage the development of student organizations. Participation in such activities can provide students with opportunities for personal growth in leadership, citizenship, interpersonal skills, communication skills, cultural competency, and cooperation. The goals and objectives of each organization and support group will differ depending upon the type of organization and its membership.

### How to Start a Student Organization

All Student Organizations should adhere to the following guidelines (LEAP) to help develop their leadership skills and in the spirit of Dunwoody's mission "to develop into leaders and entrepreneurs, and to engage in the "better performance of life's duties":

Link group interests in enhancing leadership, citizenship, interpersonal skills, communication skills, cultural competency, and education.

Encourage opportunities for social interaction among members.

Assist in the development of personal and organizational leadership skills by facilitating self-initiated and self-directed activities (must be led by students, not advisors).

Promote community/diversity awareness and responsibility.

Positively impact Dunwoody and the school's strategic objectives through appropriate planning and implementation of all projects and activities.

### Requirements for Student Organizations:

Every student organization shall have at least one advisor who is a Dunwoody employee, faculty or staff, who attends all meetings and organization events.

All organizations must:

1. Student organizations shall not discriminate any membership on the basis of race/ethnicity, religion, gender, age, national origin, sexual orientation, or ability.
2. Establish effective and appropriate procedures and/or by-laws to facilitate meetings
3. Recruit and select members
4. Communicate between members, advisors, and Dunwoody
5. Manage Student Organization budget. Organizations must follow the fundraising and accounting guidelines as seen in the "Fundraising" section.
6. Observe student privacy regulations (FERPA)

7. Resolve issues and/or complaints in a timely manner consistent with existing Dunwoody College of Technology policies and procedures such as Sexual Assault and Harassment Policy and Student Code of Conduct.
8. Record attendance and student organization's advisor is responsible for collection.
9. As appropriate, all students shall have the opportunity to participate in the organization's activities.
10. Leadership and Engagement Coordinator has right to deny funds that may not have appropriate connection/benefit to Student Organization.
11. All events and guests hosted by a Student Organization must be approved by the Leadership and Engagement Coordinator.

If guidelines are not met, the Student Organization may be put on a one-semester probation period where they may be denied funds.

**To start your Student Organization, please fill out this form** (<https://dunwoody.edu/campus-life/student-organizations>).

### Advisor Duties

The staff or faculty advisor is the central to the success of our student clubs and organizations as she sets the tone, norms, and acts as a guide for our student clubs and organizations. The advisor fulfills a key piece of Dunwoody's Mission, ". . . (for our students) to develop into leaders and entrepreneurs, and to engage in "the better performance of life's duties". Our staff and faculty advisors are the role models that challenge our students to become leaders in their industry.

As an advisor, you are not responsible for initiating a club, organization, or association, however you are responsible for the following. Failure to comply with this agreement will make your club or organization ineligible for the allocated student activity fees which are managed through our Student Government Association.

As an advisor, you agree to carry out the following duties with my student organization

- Attend all organizational leadership meetings
- Approve or deny all organization expenditures
- Assist in managing the organizations budget
- Attend at least one club and association advisor meeting per academic year and read meeting minutes of missed meetings.
- Serve in this role for one academic year
- Supervise and help implement all advertising of the organization
- Assist as primary contact in resolving issues, complaints, and needs of the organization
- Follow the Development's department fundraising guidelines as found in the Student Handbook
- Provide any concerns to Jonathon Moore, Leadership and Engagement Coordinator, [jmoore@dunwoody.edu](mailto:jmoore@dunwoody.edu)

### Student Responsibilities

As a student leader and a representative of Dunwoody, your actions and your student organization actions are a reflection of our community.

As a student organization, your organization follows the policies and regulations of Dunwoody, such as the Code of Conduct (p. 183) and our Sexual Assault and harassment policy (p. 186), and the policies within this section of Student Leadership and Engagement.

## Policy for Student Organization Fundraisers

Student Organization fundraising allows for our students to experience more opportunities through their organizations such as national and regional conferences. Please see the areas below on the policies and procedures for raising money as a student organization.

### Student Government Funding Request

The Student Activity Fund is administered through the Dunwoody Student Government. This fund was established to support student initiated events and activities. It is intended to provide a secondary option after fundraising. This is for future spending and not a reimbursement for previous purchases.

### The Budget Request Process

Please submit a Budget and Funding Request Form and a typed statement outlining the purpose of the funding and the impact it will have on your organization, department, and the College as a whole (if applicable) to Kelli Sattler, [ksattler@dunwoody.edu](mailto:ksattler@dunwoody.edu).

- Up to \$200 can be requested in writing
- Fund requests over \$200 will also require a brief presentation by the individual organization representatives.
- Organizations can request funding up to \$1,000 total from SGA for the year.
- Students are also encouraged to do pre-approved fundraising activities that will increase the balance of their individual organization budget

### Accounting Procedures for Fundraising

Student Organizations who want to hold fundraisers should complete a Fundraiser Request Form and turn it into Accounting at least 1 day prior to event.

Credit card payments are only to be taken via the Clover Flex credit card readers. The student organization will be assigned a PIN number for these machines which will correspond the four digit Fund Number in the G/L. The PIN's are set up through the Clover Online Portal. The Role for these users is Student Org and the Faculty advisor is the person who is entered for set up.

A cash box with \$100 in change (\$25 in 1's, \$45 in 5's and \$30 in 10's) will be kept on hand in the safe for student fundraisers. (This will be part of the Cash On Hand)

## Food and Beverage

Taher Catering is our current food service provider. When ordering food catering for events, you must contact Taher ([Taher@dunwoody.edu](mailto:Taher@dunwoody.edu)) at least two weeks in advance of event/meeting. Taher will need final count at least one week prior to event. Student Organizations should assign a spokesperson to communicate with Taher, to ensure clear communication and expectations.

As Taher is our on campus food service provider, student organizations must receive a quote from them when considering third party vendors for food when conducting larger events or fundraisers. Larger events are

considered events that are serving food to people outside of your club. For example, anything larger than a student organization meeting.

## Campus Room Reservations

Student Leaders: Please see your Advisor to reserve rooms on campus due to Dunwoody's intranet access limitations.

For Advisors: To reserve classrooms or meeting rooms for their student organization meetings or campus events, please access Meeting Room Manger to reserve rooms. To access the site, log-in via Dunwoody Launchpad and click on the icon. If you have any questions, please contact Jonathon Moore at [jmoore@dunwoody.edu](mailto:jmoore@dunwoody.edu)

## Communications

There are several ways to communicate news and information about your club or organization.

To create a poster for student bulletin boards, please contact Student Affairs at [studentaffairs@dunwoody.edu](mailto:studentaffairs@dunwoody.edu) as well as Marketing at [marketing@dunwoody.edu](mailto:marketing@dunwoody.edu).

To display an announcement on the campus plasma screens, please contact Marketing at [marketing@dunwoody.edu](mailto:marketing@dunwoody.edu).

To promote an event or activity in the College's weekly newsletter, the DC Weekly, (for students) and/or the Dunwoody Observer (for employees), please contact Marketing at [marketing@dunwoody.edu](mailto:marketing@dunwoody.edu).

Common communication needs include club recruitment, fundraisers, and school-wide events and activities. Please note these platforms should only be used when looking to promote your activity to the College as a whole. A different means of communication should be used when communicating directly to members of your club.

## Off Campus Expectations

All Student Organization off campus events are held to the same standards as on campus events. The policies and procedures within the student handbook and catalog are applicable to all student organization events regardless of location.

# STUDENT RIGHTS AND RESPONSIBILITIES

In order for Dunwoody to fulfill its mission of preparing students for their careers, developing into leaders, and engaging in “the better performance of life’s duties”, the College has a vested interest in maintaining an environment in which all students can pursue their academic responsibilities. Professional and career development is integral to our culture, and it is the expectation that students conduct themselves as they would in all employment situations. As students, you, have rights and responsibilities while in attendance. Please review the following sections for more information.

## Accommodation Requests

Dunwoody College of Technology is committed to creating equal access and opportunity to all campus programs and services for persons with disabilities. Means of equal access are provided to students with documented disabilities to provide them the opportunity to show their abilities and capabilities, not highlight their disabilities. Students are responsible for initiating the learning accommodation process. This is different than high school. Please see the chart below that explains the differences between high school and college learning accommodations and explore on our process, below.

At any time throughout the process, please feel free to reach out to our Associate Dean of Students, John Richardson, MA. (jrichardson@dunwoody.edu)

### Process for Learning Accommodations

1. Students can request an accommodation for a disability or a special need by completing a Student Request for Learning Accommodations or Special Need Form, which can be obtained from Student Affairs or here: <http://www.dunwoody.edu/pdfs/LearningAccommodationSpecialNeedRequest.pdf>
2. A student must provide current documentation from an appropriate licensed professional or agency. Documentation should include educational, medical, psychological, and/or other diagnostic evaluations that define the nature of the disability. In addition, this information should outline how the condition(s) may affect the student academically, along with a recommendation for appropriate accommodations. Please note that IEP’s and 504 plans are not used to define disabilities or accommodations, however they are helpful in the accommodations’ process to see what has worked in an educational setting in the past.
3. Once all documentation is received and the request form is filled out, then the Associate Dean of Students will certify eligibility for disability services and determine reasonable accommodations. Some accommodation requests will be reviewed with the student’s academic Dean, the Dean of Students, or the Provost depending on the request. If you would like to schedule a meeting regarding an accommodation, please check with the Associate Dean of Students. Accommodations are determined on a case-by-case basis. The Associate Dean of Students may reach out to the student during this process.
4. If the accommodation request is complete and approved, then the student works with the instructor for each class to define the details of the request. The student and faculty will use the student’s accommodation letter to clearly state what the accommodations look

like for each class. For example, extra time for a lab class will look different than extra time for a lecture class. This avoids confusion for both parties. Every effort must be made to ensure the requested accommodations are in place. Faculty and/or students should consult with the Associate Dean of Students, if additional information or clarification of an accommodation is needed.

### Learning Accommodations in High School Versus College

In High School	In College
The school identifies students with disabilities.	The school protects a student’s right to privacy and confidentiality.
The school district is responsible for evaluating and documenting the student’s learning disability.	The student is responsible for providing current documentation of the disability to the college.
The school automatically incorporates accommodations into the student’s daily schedule once a disability is documented.	The student must request accommodations each time they are needed.
The school modifies the educational programs.	The college makes reasonable adjustments in instructional programs which do not alter the essential content or requirements of a course or program.
Parents are advocates for their children.	Students are their own advocates.
Special classes and placement must be available for students.	Colleges are not required to provide special classes or programs for students with disabilities.
Parents are notified and must give permission for any decisions regarding their son or daughter.	Parents are not notified of services their son or daughter requests unless the student grants permission for that information to be released.
An IEP meeting is held to determine placement and appropriate services.	Students work with college professionals and instructors to determine if and what services are appropriate.
The school provides assessment of disabilities.	The school provides access to testing services which are accessible to persons without disabilities.

## Anthony L. Ferrara Career Services Center Policy

### Student and Graduate Policies, Terms, and Conditions

The Anthony L. Ferrara Career Services Center is dedicated to providing lifelong employment assistance to Dunwoody students/graduates at no cost. We support the Dunwoody vision, mission, and goals of assisting “Graduates who are worth more” to build the foundation for a rewarding and lifelong career.

The Career Services Center is a part of Dunwoody College’s division of Student Affairs and supports its mission to inspire and support students’ academic and social engagement at the College through cultivation

of programs and services that demonstrate inclusion, integrity, and innovation grounded in a career-focused framework.

## Career Services Center Services

Career Services staff are available to meet with you concerning any and all of your career needs. Drop-in assistance is available. Appointments are recommended for Alumni and for any meeting longer than 30 minutes.

- One-on-One Career Advising
- Resume and Cover Letter Review
- MyCareer Assistance and other Job Search Help
- Mock Interviews and Feedback
- Negotiating Job Offers
- LinkedIn Profile Review
- Career Fair and Networking Preparation
- Coordination of On-Campus Recruitment

## MyCareer

Dunwoody College of Technology partners with Symplicity to provide MyCareer, a free web-based portal for publicizing all bona fide full-time, part-time, seasonal, and internship positions and other recruiting activities for small and large businesses, government agencies, and nonprofit organizations to current students and graduates.

## Integrity in Representation

Students and alumni will be expected to submit truthful and accurate information on any and all application materials.

## Professional Conduct

Students and alumni are expected to behave professionally during all aspects of the job search and throughout the course of their employment.

Students and alumni are expected to accept offers of employment in good faith and to notify employers of acceptance or non-acceptance of the offer; after accepting a position, students and alumni should withdraw their candidacy from all other opportunities.

Reneging on accepting a job can severely damage students' reputation, not only in the short-term, but also for the duration of your career.

Reneging can also have negative implications on Dunwoody College's relationship with the employer and can adversely impact future opportunities for other Dunwoody College students.

Career Services is not in support of a renege situation on your part unless under extenuating circumstances. You can avoid a reneging situation by carefully planning and managing your job search and by seeking advice from Career Services and trusted professionals in your network.

## Eligibility for Career Services Assistance

All currently enrolled Dunwoody College students and graduates are eligible to receive all Career Services assistance at no cost. Career Services assistance is available to students approximately 2 weeks before the beginning of their first semester. Career Services assistance is not available to students who terminate their student status without graduating, students barred or disqualified from student status, graduates who are not in good standing with Student Accounts, or students who have abused the services and are notified the service is no longer available.

## Resume Books and Resume Referrals

As users of MyCareer, students have the option of inclusion in resume books which allows prospective employers to search and contact students directly. By participating in resume books, students and alumni consent to the release of their resume and certain employment related information. Resumes are not shared with third parties, such as employment agencies or search firms. Only the resumes of students who have given permission to have their resume included in resume books are shared with prospective employers. Students have the option to opt in or out of having their resume included in resume books. Resume referrals will be generated only from students who have opted in to the current resume book.

## Job Searching, Employers, and Fraudulent Job Postings

Dunwoody College does not endorse any employer and makes no guarantees about any position listed through MyCareer. Dunwoody College is not responsible for the safety, wages, working conditions, or any other aspect of employment. While the Career Center makes every effort to screen employers and job postings received, it is the responsibility of the job seeker to research the integrity of the firm/organization to which he/she is applying. The student is advised to use caution and common sense when applying for a position with an organization or private party.

Students, please be aware of fraudulent job postings. We do our best in the Career Services Center to delete questionable postings before you ever see them, but we are not always successful. It is also a good practice to google the employer and/or visit the employer website before you provide them with any personal information. If you receive a suspicious email or phone message from an employer, or have suspicious contact with an employer during a phone or in-person interview, it is extremely important for you to use caution and alert the Career Services Center immediately.

## How to Identify a Scam or Fraudulent Job Postings

- If you receive an unsolicited email message about a job opening.
- An upfront fee is required for materials or products prior to your work start date.
- The potential employer does not provide a physical address and phone number in the ad.
- The potential employer asks for your social security number, credit card or bank account numbers, or copies of personal documents.
- The potential employer requires you to send payment by wire services or courier and will reimburse you via check by priority mail.
- The potential employer offers a "reward" in exchange for allowing the use of your bank account – often for depositing checks or transferring money.
- You receive an unexpectedly large check in the mail with instructions to deposit the check into your bank account and await further instructions.
- There are multiple spelling and/or grammatical errors in the job announcement.
- The potential employer uses the name of a legitimate employer but spells it slightly different.
- The job opportunity sounds too good to be true.

If you feel uncomfortable about an employer or job opportunity you receive or find on an electronic job board, please notify the Career Services by emailing [CareerServices@Dunwoody.edu](mailto:CareerServices@Dunwoody.edu), calling (612) 381-3322 or stopping by Career Services. We would also like to assure



students that all information you provide to Career Services about an issue is considered confidential. Your career advisor may consult with other professional staff members within the division to ensure that you receive the best assistance possible. Information, however, will not be released outside the division without your consent, except when required by law (i.e., reasonable suspicion of child or elder abuse, imminent danger to self or others, etc.).

### **Anthony L. Ferrara Career Services Center Staff**

Rob Borchardt, Associate Director of Career Services

612-381-3322, [rborchardt@Dunwoody.edu](mailto:rborchardt@Dunwoody.edu) or  
[CareerServices@Dunwoody.edu](mailto:CareerServices@Dunwoody.edu)

## **Drug, Alcohol and Tobacco Policies**

Drug and alcohol abuse affects the health, safety, and well-being of all students and restricts Dunwoody's ability to carry out its mission. Dunwoody prohibits the possession, use, or distribution of illegal drugs, narcotics, medical marijuana, and alcohol on any campus property or as part of any Dunwoody sanctioned activity.

### **Health Risks of Alcohol and Drug Use**

Short term health risks of alcohol include risky sexual behaviors, car accidents, violent or aggressive behavior, and/or miscarriages. Long term health risks of alcohol include high blood pressure, learning and memory problems, alcohol dependency, and/or depression. For more information on the health risks associated with alcohol please see the Center for Disease Control's website: <https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>

The health risks as a result of drug use varies with each drug. The following links provide the health effects of "Club Drugs" and other "Commonly Abused Drugs".

National Institute on Drug Abuse, "Commonly Abused Drugs": <https://www.drugabuse.gov/drugs-abuse/commonly-abused-drugs-charts>

National Institute on Drug Abuse, "Club Drugs": <https://www.drugabuse.gov/drugs-abuse/club-drugs>

### **Sanctions for Drug and Alcohol Policy Violations**

Students who violate Dunwoody's policy against illegal drugs, narcotics, and alcohol are subject to Dunwoody College of Technology's student code of conduct which can be found here: <https://nextcatalog.dunwoody.edu/catalog-student-handbook/student-rights-responsibilities/student-code-conduct/>

#### **Student Code of Conduct Sanctions**

The following sanctions may be imposed on any student or student organization found to be in violation of the code of conduct or any other college policy. The sanction will be in relation to the violation as more severe or pervasive violations will result in more severe sanctions. The following list is not exclusive as other sanctions may be imposed that fit within the guiding principles of this policy. The following sanctions may include additional conditions such as a reflection activity, restitution of financial damages, mental health counseling, meeting with staff on a rotating basis, removal of college property, failing an academic course, or pursuing legal actions.

**Warning:** A written or verbal notification to a student that their behavior has violated the code of conduct.

**Probation:** The conditions of the probation are based on the intensity of the violation. While on probation, if the student violates another college policy or does not follow the stipulations of the probation, then they may be suspended from the College. The probation notification explains: the stipulations of the probation, the length of the suspension, assigned probation conditions, appeal options, and an explanation that any further violation of the code of conduct or failure to follow the stipulations of the probation may result in immediate suspension from the college.

**Suspension:** A suspension means that the violation was severe enough to involuntarily separate the student from the College for a certain length of time. The suspension notification explains: the stipulations of the suspension, the length of the suspension, assigned suspension conditions, appeal options, and college reentry conditions.

**Expulsion:** An expulsion means that the violation was severe enough to permanently and involuntarily separate the student from the College. The notification explains: the stipulations of the expulsion and the assigned expulsion conditions.

### **Federal Laws and Sanctions**

Federal laws carry penalties for controlled substance convictions. These range from one year imprisonment and up to a lifetime of imprisonment. Along with imprisonment federal convictions carry fines ranging from \$1,000 to \$2,000,000 depending on the severity of the conviction. Please see the following for a detailed list of federal controlled substance convictions:

Federal Controlled Substances Act: <https://www.deadiversion.usdoj.gov/21cfr/21usc/index.html>

Federal Trafficking Penalties: [https://www.dea.gov/sites/default/files/drug\\_of\\_abuse.pdf#page=30](https://www.dea.gov/sites/default/files/drug_of_abuse.pdf#page=30)

### **Minnesota Laws and Sanctions**

Minnesota laws carry penalties for controlled substance convictions. These range from underage drinking laws with a penalty of \$100 to 40 years prison sentence and \$1,000,000 fine. Please see the following for a detailed list of Minnesota controlled substance and alcohol statutes:

Minnesota Controlled Substances Statutes: <https://www.revisor.mn.gov/statutes/?id=152>

Minnesota Underage Alcohol Statutes: <https://www.revisor.mn.gov/statutes/?id=340A.503>

Minnesota Driving while Impaired Statutes: <https://www.revisor.mn.gov/statutes/?id=169A>

### **Drug and Alcohol Education and Treatment Programs**

Dunwoody College of Technology recognizes drug and alcohol dependency/abuse as a major health problem, as well as a safety and security problem. If you have a drug or alcohol problem or know of another student with such a problem, please consult with anyone in Student Affairs for information and referral resources for a variety of public and private educational and treatment programs in the state and metropolitan area. Such as the Walk In Counseling Centers that are located throughout the Twin Cities. They do not require an appointment and have a variety of office hours.

Walk In Counseling Center Locations:  
Main Number: 612-870-0565  
2421 Chicago Avenue S



Minneapolis, MN 55404

1619 Dayton Avenue, #205  
St. Paul, MN 55104

179 E. Robie Street  
St. Paul, MN 55107

## Tobacco-Free Environment

The use of all forms of tobacco, including chewing tobacco and smokeless cigarettes, is prohibited at Dunwoody except in designated areas. Dunwoody's designated areas are located near the north entrance of the main building as well as the west entrance of the lower level of the Warren Building. Smoking on the west side (main entrance) and east side of the Main Building is prohibited at all times. Students residing in our student housing facility have a designated tobacco area at the Delaware Street entrance. Violation of the tobacco regulation is a violation of our student's code of conduct and may result in conduct sanctions.

## Electronic Cigarettes

The use of electronic cigarettes (also known as e-cigarettes) is prohibited at Dunwoody except in designated smoking areas. For more information please refer to the student handbook.

# Housing Policy

## Community Policies

Student agrees to observe and be bound by all the policies, rules, and regulations of Dunwoody College of Technology ("DCT"), including those stipulated in the Student Code of Conduct ("Code") within the Student Handbook ("Handbook"), Terms and Conditions within the agreement as well as any other publications by and available through DCT including all rules or modifications of rules that shall be subsequently made. Additionally, as members of a private student housing complex, there are concurrent policies that are enforced by the student housing complex, hereby known as UP Rules, University Partners ("UP") Resident Handbook. Student acknowledges that they have access to, and understand the existing rules and regulations referred to in this section.

## License Agreement Break Fee

Student is responsible for the payment of a license break fee in an amount equal to the remainder of the current month plus two additional months if the student's occupancy in housing is terminated for any of the following reasons:

1. Student withdraws and/or student status is terminated for any reason from DCT.
2. Student fails to pay when due any amount to be paid under this agreement or their enrollment agreement with DCT.
3. Any violation of this license agreement, DCT's Code of Conduct, or UP Resident Handbook that results in an early termination of occupancy
4. Unacceptable results, in DCT's sole judgment, of a criminal record and/or background check on the student

Student acknowledges that the license break fee represents liquidated damages that will be suffered by DCT due to the early termination of this agreement and such damages are difficult to ascertain. The license break fee shall not reduce the student's liability for damages caused to the unit or personal property. Payment of the license break fee shall not affect the student's liability to pay any other charges, bills, or costs incurred during the occupancy or as a result of any early termination.

## Authorized Room and/or Building Access

DCT reserves the right for its employees and agents, or the owners of the Complex and their agents or employees, to access and inspect any Licensed Space at any time and without notice as needed (24 hours per day, 7 days a week) for any health, safety, or security reasons; or to ensure compliance of the DCT's Code or Handbook, or UP's resident handbook; or to inspect or perform maintenance work. The personal property of the Student may be search at the discretion of DCT for the purposes of safety and security.

DCT shall have the right, but not the obligation, to conduct random health and safety inspections in all rooms within a licensed space. Any prohibited items found during the inspections will be immediately disabled, confiscated, and/or disposed of without compensation.

"Prohibited items" are listed below, in DCT's Code and Handbook and in UP's Resident Handbook. Student acknowledges and agrees to confiscation and disposal of such prohibited items without compensation. Administrative /disciplinary action may result from health and safety violation. The Minneapolis Police will be contacted for items or activities found that pose a substantial threat to person, property, or are prohibited by DCT or UP, which include, but are not limited to, illegal drugs, weapons, explosives, etc.

## Occupancy and Use of Licensed Space

Student agrees that they will not allow another person(s) to occupy the licensed space, sublet the licensed space, or assign this Agreement to another person(s). This Agreement cannot be extended into a future licensed period.

As a general rule, Licensed Space swaps and changes requested by Student will be considered in a timely manner. Changes can be made only under special circumstances, if alternative space desired is determined to be vacant, and if approved by DCT employees. DCT will oversee the room swap and change processes for all Students and Licensed Spaces. Unauthorized moves, unauthorized use, possession, duplication/transfer of room keys, or access devices may result in disciplinary action, a return to the original room, and/or termination of this contract and eviction from the Complex. Inasmuch as possible, Student will be given 48 hours' notice prior to receiving a new roommate, except in cases where immediate relocation is deemed necessary by DCT employees.

Student acknowledges and understands that DCT shall have the right at any time to transfer or administratively move Student to another space and that occupancy of the new housing assignment shall be subject to all Terms and Conditions herein, with the exception that the financial charged assessed will be adjusted where appropriate.

If Student poses a threat of harm to the safety of themselves or any member of the Complex, then Student must receive a 'clearance form' from both a medical professional, or designee, and the Dean of Students, or designee, prior to returning to the Complex and Licensed Space. Immediate or eventual return to the Complex is at the sole discretion of DCT employees.

Is student's behavior or actions disturb the peace of the Complex or Licensed Space, or require excessive or continuing intervention from the Housing Conduct Officer, and/or DCT employees, and/or UP staff, Student may receive sanctions from the Code. If found in violation of the Code, Student may be removed from the Licensed Space and Complex, in addition to other appropriate sanctions.

The use of the Complex and the Licensed Space are limited to residential student housing use, and are not to be used for any business or

commercial use. This includes conducting any online business. Student agrees to follow the “Information Technology Policies” as found in the Handbook. Student organization fundraising activities may be authorized following standard student organization fundraising guidelines. Non student organization fundraising is not allowed in Complex or Licensed Space.

## Visitation Policy

Visitors include non-residents of a room or unit, including, but not limited to, other DCT students as well as individuals not enrolled in DCT, including parents and siblings. Visitors must be over eighteen years of age. Student will be held responsible for the behavior of their visitors and for their visitors’ adherence to DCT Code and Handbook and UP’s Residential Handbook and federal and/or local law. Visitors are allowed from 7:00 am until 10:00 pm Sunday through Thursday and from 7:00 am until 11:59 pm on Friday and Saturday.

Student may not have overnight visitors for more than eight (8) nights per month. Overnight visitors may stay for no more than four (4) consecutive nights in any two week period. Visitation is limited to no more than two overnight visitors per licensed space and not per resident. Prior notification to DCT employees must be made in advance and in writing at least 48 hours before overnight visitor arrives. Student must also have approval from all roommates present at time of overnight visitor and not violate their agreed upon Roommate Contract agreement on overnight visitors.

## Room Care and Condition

Student is responsible for the care and condition of their licensed space and any common areas. A licensed space becomes excessively unsanitary so as to create health hazards will be ordered to be cleaned by Student or by a professional cleaning personnel, if necessary. In the event, Student fails to adequately clean as ordered or fails to complete within timeframe established by DCT employees, then DCT reserves the right to complete the cleaning and charge Student for all associated costs. Student may be also subject to administrative/disciplinary action. As mentioned in above, ‘Visitation Policy’, Student is responsible for all of their guest’s behavior which includes cleanliness.

Student is responsible for damage beyond normal wear and tear to the Licensed Space or the Complex. Student is responsible for maintaining the condition of their Licensed Space and submitting maintenance requests to UP if there are maintenance concerns. If Student litters, deface, or damages common areas, Licensed Space, or any other area of the Complex, then Student will be charged for the cost associated with any repair, cleaning, or replacement and any administrative fees associated with the repair, cleaning, or replacement. Student may also be subject to administrative and /or disciplinary actions for damages caused. For damages in shared spaces within the Licensed space, charges may be billed equally amongst all registered residents in that space unless a Student claims responsibility.

Student acknowledges, by entering into this Agreement, that they have access to UP’s Residential handbook and the following sections; ‘Your apartment home’, Your Community, and Maintenance’. These sections highlight the Student’s rights and responsibilities for keys, maintenance, trash, decorating walls, HVAC issues, and general room care and condition.

## Personal Property of the Student

DCT will not in any event or at any time be responsible for any damage to personal property of the Student or of any other person by reason of

fire or other casualty, or for any damage or theft or other loss of such personal property. DCT strongly recommends that the Student maintain fire, casualty, theft, and personal loss insurance (renters’ insurance) covering their personal property which is located in or about the Licensed Space or Complex. DCT will not hold personal property left behind by the Student after they move out for any length of time and reserves the right to discard or donate them to charity without notification if alternate arrangements have not been agreed upon in writing with DCT employees.

## Prohibited Items

The following items are prohibited: water beds, television antennae placed outside of the Licensed Space, any chemical, liquid, or solid identified as hazardous, candles with or without a wick, incense, dart boards, halogen lamps, sun lamps, space heaters without a safety feature, weight lifting equipment, live holiday decorations, and inflatable pools. Student has access to bicycle racks and is not permitted to store or maintain bicycles in Licensed Space. See weapons “Explosives/ Weapons” and “Drugs and Alcohol”, below for additional prohibited items. Pets, of any kind, are not allowed in the Licensed Space, see “Emotional Support Animals” for more details.

## Explosives/Weapons

Weapons are not permitted. Objects with potential to cause bodily harm to a person are not allowed in the Licensed Space, Complex, or Complex parking lot. Such objects include, but are not limited to: ammunition, fireworks, explosives, firearms, BB/Pellet guns, shotguns, stun guns or tasers, knives, bows and arrows, water guns, paint ball guns, various martial arts weapons, decorative weapons and objects deemed threatening in nature by DCT employees.

## Drugs and Alcohol

DCT prohibits the possession, use, sale, manufacture, or distribution of illegal drugs, narcotics, and alcohol on school property or as part of any school activity, regardless of location or age of resident. This includes being under the influence of alcohol. The possession of drug and alcohol paraphernalia is also prohibited. This includes items that are used or could be used in connection with drinking games, or rapid, mass, or otherwise dangerous consumption of drugs and/or alcohol. This section also relates to medical marijuana. Marijuana is classified as an illegal drug under the Federal Controlled Substances Act. In addition, the possession, use, manufacture, sale, or distribution of prescription drugs by a student to whom the medication was not prescribed is prohibited. DCT reserves the right to confiscate, retain, and dispose or/destroy any and all drug and/or alcohol related items regardless of value or ownership. DCT reserves the right to call local authorities such as the Minneapolis Police Department, if DCT deems necessary to report illegal activity. The Complex is tobacco free with designated tobacco use areas outside of facility.

## Subletting

Student may not assign, sublet, or transfer anyone, including but not limited to other DCT students, this Agreement or any of its rights and obligations. A Student who violates this section will be liable for all expenses incurred by DCT for removal of any third party and may be charge for the full length of the Agreement, even if Student has vacated the Licensed Space.

## Cohabitation

Cohabitation is not allowed in the Complex. Cohabitation is defined as a person using the Licensed Space as if that person were living in the room

but not actually being assigned as a resident of that Licensed Space or room.

## Sexual Harassment and Sexual Assault

Sexual Harassment and sexual assault are not tolerated. Student acknowledges, by entering into this Agreement, that they have read and have access to DCT Code and Handbook which contains a comprehensive sexual harassment and sexual assault policy (p. 186); and Student has completed mandatory online Title IX training prior to the start of the academic year.

## Emotional Support Animals in the Complex

Student requesting an emotional support animal must notify the Associate Dean of Students for the approval process. As mentioned in "Prohibited Items", pets are not allowed.

# Information Technology Policies

## Acceptable Use Policy

In accordance with its mission and purpose, Dunwoody provides computing resources to Dunwoody students and employees. These resources are for instruction, study, academic research, and the official work of college organizations and offices. To maintain a safe and productive environment for all users of these computing resources you must:

- Comply with all federal, state, and local laws
- Comply with all Dunwoody rules, policies, and applicable contracts and licenses
- Use only those resources and information that they are authorized to use in the manner and extent to which access was authorized
- Respect the intellectual property, work, and privacy of other users and accounts
- Respect the capacity of these resources by limiting use to reasonable levels
- Protect your username, password, and IDs from unauthorized use
- Cooperate with administrators if presented with information regarding an issue with their account or systems

The following types of activities, although not an exclusive list, are specifically prohibited and may result in appropriate disciplinary action:

- View, damage, transfer, edit or delete other users' files, or communications without authorization
- Use Dunwoody-owned/supplied account, credentials, computer, and/or network to gain unauthorized access into, or compromise the security of any computer system in any location
- Unauthorized and illegal processing, distribution, storage, and/or sharing of intellectual property and/or copyrighted material (i.e., music, movies, and software), including the use of unauthorized peer-to-peer file-sharing applications or services, may also be subject to civil and criminal liabilities including fines and/or imprisonment
- Engage in any activity that may be harmful to systems or data stored upon said systems, such as sharing your password or account with others, creating or propagating viruses, worms, or Trojans or disabling or circumventing anti-malware protections and/or protective systems
- Use Dunwoody-owned/supplied communications system, such as email or voicemail, to threaten, intimidate, or harass others
- Use Dunwoody-owned/supplied systems or content for the distribution of political campaign materials or for financial gain,

whether personal or commercial, including spam, chain letters, solicitation of business or services, sales of property, etc.

- Abuse of email systems including spoofing sender addresses, forging the identity of a user or machine in an e-mail message, and/or sending unauthorized all-campus email messages
- Create, store, process, browse, or display any racially-offensive, gender-offensive or likewise obscene material including pornography
- Consume network or computer resources to the exclusion of another's use; for example, overloading the network with legitimate (i.e., file backup, videos, etc.) or illegitimate (i.e., denial of service attack) activities
- Attach any device or computer not owned or supplied by Dunwoody to the campus network without prior authorization
- Post or transmit Dunwoody's confidential materials, policies, or procedures on websites, electronic bulletin boards, chat rooms, and/or other publicly accessible digital media, which violate existing laws, regulations, or Dunwoody's policies or codes of conduct

## Backup Policy

It is the policy of Dunwoody College of Technology to establish uniform procedures and guidelines pertaining to the backup of employee data/files on Dunwoody owned or issued computers. Employees are responsible for the data backup of their Dunwoody owned or issued computer. The IT Department provides each employee a limited amount of secure disk space on the network for storing work-related data. This secured area is included in the scheduled network backup process. Upon request, the IT Service Desk will provide you with a backup-process document and guidance. It is the responsibility of each employee to ensure that his or her data are stored in this secure disk space. The IT Department (at its discretion) will review requests for additional disk space should the minimum allowance be exceeded.

In addition to on premise network storage, Dunwoody provides everyone with an Office 365 account, which allows 1TB of storage in OneDrive and can be used as a secure backup location to store data.

Should a Dunwoody issued computer encounter a hard drive issue, which makes the hard drive inoperable, the IT Department will make its best effort to access the hard drive whereby the employee may be provided the opportunity to backup their data to the network.

## Network Storage

As a benefit of a network account, every user has access to network storage for use, and no one else has the rights necessary to access this individual space. One of the uses of this space is to store any files that contain confidential information.

## Electronic Communication Policy

It is the policy of Dunwoody College of Technology to establish uniform procedures and guidelines pertaining to the operation and utilization of the Company Electronic Communication System.

## E-mail, Voice mail, Internet, and Other Electronic Communications

The e-mail, computer, Internet, telephone, facsimile, printer, College owned/provided pagers and cell phones, and voice systems are College property. These systems are in place to facilitate our employee's ability to do their jobs efficiently and productively. To that end, these systems are provided for business purposes and use. While occasional use of these systems for personal, non-business use is acceptable, College employees

must demonstrate a sense of responsibility and may not abuse system privileges.

All employees should be aware that the College has software systems in place that are capable of monitoring and recording all network traffic to and from any computer employees may use. The College reserves the right to access, review, copy, and delete any information, data or messages accessed through these systems with or without notice to the employee and/or in the employee's absence. This includes, but is not limited to, all e-mail or voice-mail messages sent or received, all Internet or web sites visited, all chat sessions or electronic bulletin boards participated in, all news group activity (including groups visited, messages read and employee postings), and all file transfers into and out of the College's internal networks. The College further reserves the right to retrieve previously deleted messages from e-mail or voice mail and monitor usage of the Internet, including web sites visited and any information employees have downloaded. In addition, the College may review Internet and technology systems activity and analyze usage patterns, and may choose to publicize this data to assure that technology systems are devoted to legitimate business purposes. Accordingly, employees should not have any expectation of privacy as to their Internet or technology systems usage and should not use these systems for information they wish to keep private.

Communications and use of e-mail, computers, and Internet, telephone and voice mail systems will be held to the same standard as all other business communications, including compliance with our anti-discrimination and anti-harassment policies. This means that the College does not allow these systems to be used in creating, receiving, sending or storing data that may reasonably be considered to be offensive, defamatory, obscene, or harassing. This data includes, but is not limited to, sexual images and comments, racial and gender based slurs, or anything that would reasonably be expected to offend someone based on their disability, age, religion, marital status, sexual orientation, political beliefs, national origin, culture or any other factor protected by law. Any such use would violate this policy and may violate other College policies. Additionally, e-mail must not be used to solicit others for commercial ventures, religious or political causes, outside organizations, or other non-business matters. Employees must not use the e-mail or voice mail systems in a way that causes congestion on the systems or that significantly interferes another employee's ability to use the systems. The College expects its employees to use good judgment in the use of our College's systems. Management should be notified of unsolicited, offensive materials received by an employee on any of these systems.

Employees must respect other people's electronic communications. Employees may not obtain unauthorized access to another's e-mail or voice mail messages, except pursuant to direction from the College's executive management and Human Resources for the purposes specified above.

Employees consent to and acknowledge that, compliance with e-mail, computer, Internet, telephone, facsimile, printer, pager, cell phone and voice mail policies are a term and condition of employment. Failure to abide by these policies and rules, or failure to consent to any intercepting, monitoring, copying, reviewing or downloading of any communications or files is subject to disciplinary action up to and including termination of employment with the College. Employees should never, without an appropriate Dunwoody owned license and permission from the College, copy or distribute, including the College e-mail systems, copyrighted material. Copyrighted material includes, but is not limited to, College and third party software, database files, and documentation.

Employees must not disseminate, forward, copy or send e-mail correspondence or any other communication to anyone or any employee who has no reasonable need to receive such e-mail. Further, e-mail and other communications containing misleading, inaccurate or inappropriate information or references may constitute misconduct by an employee. Employees should always be mindful of the content of e-mail and other communications because such communications can be later construed against the employee and the College. E-mail and electronic communications regarding (i) College products, services or price quotations, and (ii) quotes for purchase by the College of outside parties' products or services, are often later construed as binding contracts with the College. These situations may cause unintended and substantial damage and/or obligations for the College. It is very important to avoid these situations. It is College policy that all e-mail and electronic communications regarding the sale of College products or services and the purchase by the College of goods and services must always contain a clear statement that such communications are "for discussion purposes only and not binding on the College." It is each employee's responsibility to adhere to the College's policies with regard to purchasing and sales contracts.

## Data Privacy Policy

Dunwoody makes reasonable efforts to maintain data privacy and, as a rule, Dunwoody employees will not read your email or files; however, there is no guarantee of data privacy for files and email stored on, or transmitted across, the College systems or network. Furthermore, Dunwoody reserves the right for designated members of the College's staff to log and examine traffic on the College's network and to retrieve and examine files stored on the College's systems whenever necessary, particularly – but not exclusively – in the following situations:

- If the College receives a subpoena in relation to a court proceeding, Dunwoody will comply with electronic discovery laws requiring the disclosure of digital data, including deleted information that has been restored from backup systems.
- If an individual is suspected of or investigated for an infraction of federal, state, or local laws, or Dunwoody policies, the Dunwoody IT Department will provide the appropriate data and assistance to the Office of the Dean of Students or Human Resources Department as part of an authorized investigation.
- If requested by a federal, state, or local law enforcement agency as part of an authorized investigation.

## Dunwoody Email

Email is the official communication method at Dunwoody. You should check your Dunwoody email account daily, and make sure you are maintaining your mailbox. If you allow your mailbox to increase in size over the allocated storage limit, the mailbox will no longer send and receive email. Forwarding emails to a personal email account is against policy at Dunwoody.

If you have any issues with or questions about their email account, such as receiving messages in error, not receiving expected messages, accessing email from off-campus, or inability to access your email account, contact the IT Service Desk.

## Phishing and other Forms of Social Engineering

Beware of phishing email messages, attachments, links or phone calls. Phishing emails have dramatically increased in recent years and many of them are legitimate looking – often with a spoofed sender address and embedded company logo in the email, attached document or link.



Phishing campaigns have evolved to incorporate installation of malware and ransomware as the second stage of the attack - all with the intent to gain an initial foothold into a computer or network. Education and proper backups are key to fighting these threats. See links below for example and information on ransomware and phishing:

- Ransomware (<https://www.microsoft.com/en-us/wdsi/threats/ransomware>)
- Phishing (<http://www.microsoft.com/security/online-privacy/phishing-symptoms.aspx>)

Use caution when responding to emails, opening attachments or clicking links. If you are unsure of the authenticity of an email, please contact the IT Service Desk or forward the email to [support@dunwoody.edu](mailto:support@dunwoody.edu) so we can verify. In addition, remember, never enter your username and password unless you have verified authenticity of the email or website and never open an unsolicited attachment from your email.

## Internet Filters and Blocked Websites

To comply with laws such as the Higher Education Opportunity Act (HEOA), secure confidential information, and guard against issues such as harassment and malware, Dunwoody actively filters traffic to and from the Internet. The leadership of Dunwoody approved these filters, and the filters exist to protect Dunwoody and its employees and students from individuals and organizations that intend to do harm. Employees and students should not attempt to circumvent these filters. If there is something on the Internet that you cannot do, discuss your needs with the IT Help Desk or the Dean of Students.

## Laptops

Everyone at Dunwoody receives a laptop, with the exception of programs that offer Bring Your Own Device (BYOD). You must sign a legally binding contract and return the laptop when the relationship with Dunwoody ends or when directed by the IT Department for replacement. Anyone may bring a personal laptop or tablet to campus and connect that device to the guest Wi-Fi network; however, all work or school related data must be saved securely on Dunwoody resources and not on personal laptops, tablets or storage devices. Dunwoody will not reimburse for the purchase or use of a personal laptop or tablet. If your laptop is stolen, you must report the theft to the Dunwoody Security Team immediately, at which point a police report will be filed. Once the police report is filed and verified by the IT Service Desk, they will issue a new laptop to the user. Students are responsible for paying a stolen laptop fee up to \$800, which is refundable only if the laptop is returned.

## Non-Compliance Policy

It is the policy of Dunwoody College of Technology to establish uniform procedures pertaining to Information Technology Policy Non-Compliance. It is the responsibility of every employee and student to be in compliance with the Information Technology Policies of Dunwoody College of Technology. In addition, it is the responsibility of every employee and student to report any Information Technology Policy Non-Compliance to the Information Technology Department for investigation and resolution. The Information Technology Department will document and process all non-compliance issues per the policy implementation steps above.

This policy applies to all employees and students.

### Policy Implementation

- The Dunwoody College of Technology Information Technology Department will complete the "Information Technology Non-Compliance Form" when they encounter an employee or student whom they believe is not compliant with one or more of the Information Technology Policies.
- The "Information Technology Non-Compliance Form" will then be directed to the Information Technology Director/Manager for review and signature.
- The Information Technology Director/Manager will forward the signed form to either the Human Resources Director (employee) or the Dean of Learning (student).
- The Human Resources Director or Dean of Learning will review the non-compliance and take the appropriate actions per their guidelines.
- The Information Technology Non-Compliance form will be completed detailing the resolution and signed by the Human Resources Director or Dean of Learning who is responsible for the case.
- The completed Information Technology Non-Compliance form will be filed in the employee or student folder.

## Personal Hardware & Software Policy

It is the policy of Dunwoody College of Technology to establish uniform procedures and guidelines pertaining to personal hardware and software. No personal hardware, peripherals or software are allowed on Dunwoody computers. All hardware, peripherals and software of any kind, including in-house developed programs are the sole property of Dunwoody College.

Any hardware, peripheral or software must be purchased and installed by the Information Technology Department per the Procurement of Hardware, Peripherals and Software Policy. With respect to software and data files, personal digital images and music are considered non compliance to this policy. This policy is enforced to reduce problems with equipment, software failure, damage to data files and the introduction of viruses. To restrict access to Dunwoody College data and/or programs and to prevent virus transmission; disks, tapes and emails belonging to Dunwoody College are not to be used in personal home computers.

This policy applies to all employees.

### Policy Implementation

- The Dunwoody College Information Technology department will periodically scan each desktop and laptop for personal software and hardware. Any personal hardware, peripheral and/or software that are found will be removed. Human Resources will be notified of the non-compliance.
- The Information Technology Department is not responsible for the backup or restoration of personal software before removal.
- Non-compliance with this policy will result in appropriate disciplinary action up to and including termination.

## Peer to Peer (P2P) File Sharing Policy

Dunwoody College of Technology has established this policy to maintain student and employee compliance to the HEOA P2P File Sharing requirement.

Dunwoody College of Technology employs technical deterrents against P2P File Sharing within the Dunwoody network. The deterrents include blocking P2P network traffic, shaping bandwidth to some Internet sites, monitoring traffic to identify the largest users of Internet bandwidth, and the Dunwoody College Information Technology department will periodically scan each laptop for P2P File Sharing software.



If the scan finds P2P File Sharing software, the Dunwoody College Information Technology department will remove said software and notify the Office of the Dean of Students of its policy non-compliance.

Non-compliance with this policy will result in appropriate disciplinary action up to and including expulsion. Furthermore, Dunwoody reserves the right to initiate a legal investigation.

The College provides access to alternative legal sites for images and music, but does not provide pay-for-use subscriptions. Sites made available include, but are not limited to, iTunes, YouTube, and Hulu. Images and music obtained through documented legal procurement on Dunwoody computers for the purpose of entertainment are permissible within the scope of this policy.

Copyright infringement is the act of exercising, without permission or legal authority, one or more of the exclusive rights granted to the copyright owner under section 106 of the Copyright Act (Title 17 of the United States Code). These rights include the right to reproduce or distribute a copyrighted work. In the file-sharing context, downloading or uploading substantial parts of a copyrighted work without authority constitutes an infringement.

Penalties for copyright infringement include civil and criminal penalties. In general, anyone found liable for civil copyright infringement may be ordered to pay either actual damages or “statutory” damages affixed at not less than \$750 and not more than \$30,000 per work infringed. For “willful” infringement, a court may award up to \$150,000 per work infringed. A court can, in its discretion, also assess costs and attorneys’ fees. For details, see Title 17, United States Code, Sections 504, 505.

Willful copyright infringement can also result in criminal penalties, including imprisonment of up to five years and fines of up to \$250,000 per offense.

For more information, please see the website of the U.S. Copyright Office at [copyright.gov](http://copyright.gov) (<http://copyright.gov>), especially their FAQ’s at [copyright.gov/help/faq](http://copyright.gov/help/faq) (<http://copyright.gov/help/faq>).

## Specialized Software

The IT Department acquires all software used in the organization, whether purchase or donation. This policy ensures that these assets are properly booked and licensed and that IT has sufficient resources available for the software to run properly in our environment. Any need for additional software should be discussed with the IT Service Desk since we may already have a license for the specific application. You will not be reimbursed for software purchased through other means.

## Non-Discrimination

Dunwoody College of Technology (“Dunwoody”) is committed to the principles of equal employment opportunity and equal educational opportunity. Dunwoody does not unlawfully discriminate on the basis of race, color, creed, religion, national origin, sex, marital status, familial status, veteran/military status, disability, age, sexual orientation, gender identity, status with regard to public assistance, membership or activity in a local commission, genetic information, or any other characteristic protected by applicable law. Dunwoody’s policy on non-discrimination extends to its admission policies, financial aid programs, employment opportunities and any and all other school-administered programs.

Concerns about employment discrimination should be addressed to Human Resources. In addition, the following person(s) have been

designated to handle inquiries regarding Dunwoody’s non-discrimination policies:

Carla Pogliano Connor, Ph.D.  
Vice Provost for Program Development and Compliance  
Dunwoody College of Technology  
818 Dunwoody Blvd.  
Minneapolis, MN 55403-1192 Office: Silver level  
612-381-8236  
[cconnor@dunwoody.edu](mailto:cconnor@dunwoody.edu) ([cpogliano@dunwoody.edu](mailto:cpogliano@dunwoody.edu))

For further information on non-discrimination, visit [wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm](http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm) (<http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm>) for the address and phone number of the U.S. Department of Education Office that serves your area, or call 1-800-421-3481.

## Special Requests and Complaints

Dunwoody College of Technology is committed to providing a high quality academic environment. As such any concerns or complaints that a student may have will be taken seriously and will be reviewed and followed to resolution. Below, Dunwoody outlined a process for various types of student complaints and special requests.

### SPECIAL REQUESTS

Special requests of the College can be made by completing a Student Request Form (<http://www.dunwoody.edu/pdfs/StudentRequestForm.pdf>) located in the Office of the Dean of Students. These requests can be made by the student independently or in consultation with their Program Manager/dean or the Student Affairs Office. All completed Student Request forms are to be submitted to the Dean of Students for consideration. Once the request is submitted, the Dean of Students will notify the student of the determination as promptly as possible. Most determinations will be made immediately with every effort made to respond within ten days of submission.

### Types of Complaints

#### Academic and Non-Academic

Requested by students regarding the facilitation of their learning and their student role. Please refer to the “Complaint Procedure for Academic and Non-Academic Complaints” below.

#### Grade Appeals

Please refer to the “Grade Appeal Policy” (p. 155)

#### Harassment

Please refer to the “Unlawful Harassment and Sexual Conduct Policy” (p. 186)

#### Sexual Misconduct

Please refer to the “Unlawful Harassment and Sexual Conduct Policy” (p. 186)

### Complaint Procedure for Academic and Non-Academic Complaints

Most requests or concerns are best addressed as near as possible to the source of the concern with the individual involved, if appropriate. If the concern is not resolved to the complainant’s satisfaction, if the complainant feels unsure of who to talk with or is uncomfortable, or if the complainant has additional concerns, the Office of the Dean of

Students should be contacted, where the request or complaint policy will be executed.

- All requests and complaints received must be in writing using a Request form or a Complaint form. Forms are available from the Dean of Students.
- All requests and complaints are to be filed and discussed with the Dean of Students.
- Any complaint involving medical information will be protected by the College and confidentiality will be maintained. Release will not take place without the student's consent. After the complaint has been discussed, an investigation will occur.
- The length of the investigation will vary depending on the circumstances. Most investigations will be resolved rapidly—basic requests the same day; others where more investigation is required in less than 20 working days; only in the rare complex case will the investigation take more than 60 days. The student will be informed as to the progress in investigating the complaint.
- The student involved will be notified of the outcome of the investigation and resolution process either verbally or in writing dependent upon the complaint.
- It is understood that when the complaint involves two individuals at the College, retaliation is not tolerated and will be dealt with consistency and with College policies. Any retaliation is to be reported immediately to the Dean of Students' or Provost's Office.
- If the student is concerned with the final outcome, they may submit a written appeal to the Provost within five business days of receiving the outcome. An appeal is not considered a rehearing of the concern, but a review of the outcome based upon the results of the investigation that was undertaken. The student will be notified of the results of the Provost's review in writing within 10 business days of filing the appeal.
- All requests and appeals received by the Dean of Students will be logged and analyzed for continuous quality improvement purposes consistent with Federal Title IV requirements.
- Included in this notification will be the information on the student's current status in regard to Satisfactory Academic Progress and the *Academic/Pace Warning Success Plan form*.

## Student Code of Conduct

### Guiding Principles

In order for Dunwoody to fulfill its mission of preparing students for their careers, developing into leaders, and engaging in "the better performance of life's duties", the College has a vested interest in maintaining an environment in which all students can pursue their academic responsibilities. Professional and career development is integral to our culture, and it is the expectation that students conduct themselves as they would in all employment situations.

The Student Code of Conduct provides guidance on conduct that is not in accordance with our mission. Conduct that is not in accordance with the pursuit of our mission is subject to sanction by the College. The Code of Conduct is designed to provide students due process, to ensure the protection of all students, and to provide outcomes to conduct

violations. These procedures are not courts of law nor should be seen as a replacement for such activities, rather these are fair procedures that foster accountability and development of our students and allow the college to serve its mission.

### Scope and Reach

The Code of Conduct applies to all students and student organizations at Dunwoody College of Technology. The code applies to all conduct that occurs at any college facility, online platform, college sponsored activity, or student organization activity. At the discretion of the Dean of Students (or delegate), the code shall apply to off campus conduct that adversely affects a college interest or potentially violates a college policy.

### Dual Membership

Students are, simultaneously, members of our college community and civic citizens. Therefore, students are responsible for their actions within the College and to the larger civic community.

Students are expected to abide by the policies and procedures within this policy and to observe all city, state, local, and federal laws. This code of conduct will not interfere with any civil or criminal process. If a conduct violation falls within in both jurisdictions (College and Civic), the College reserves the right to follow either this policy or a civic action based on its interest, the interests of the affected student(s), and the interests of the community.

### Filing a Report

- You may have witnessed a violation occur, or have been directly impacted by a code of conduct violation and need to report the incident. Additionally, you may have spoken to a faculty or staff member and they told you to fill out an incident report. You can access the incident report form at [dunwoody.edu/incident-report-form](https://dunwoody.edu/incident-report-form).
- The Conduct Officer is an impartial staff member that facilitates the conduct process. This is Associate Dean of Students for our housing students and the Dean of Student for all other students.
- A written report should be turned into the Conduct Officer. The report should include the following:
  - Detailed and factual description of incident that led to the report
  - Date, time, and location of incident
  - Who was involved including any witnesses, contact information, if known, of all involved
  - Any evidence such as texts, social media posts, pictures, or videos
- In some cases a written report is not feasible due to the immediate nature of the event. In such cases, a report should be filled out immediately following the event.

There are two ways to file a report:

1. Fill out an Incident Report Form on our website: [dunwoody.edu/incident-report-form](https://dunwoody.edu/incident-report-form).
2. Email a detailed description of the incident to
  - a. For housing residents: John Richardson, Associate Dean of Students, [jrichardson@dunwoody.edu](mailto:jrichardson@dunwoody.edu).
  - b. For all students: Kelli Sattler, Dean of Students, [ksattler@dunwoody.edu](mailto:ksattler@dunwoody.edu)

The Conduct Officer will examine the report to determine if an investigation of the report should be pursued based on four pieces of information:

1. The factual merit of the report
2. The current conduct standing of involved students
3. If any policy violations have occurred
4. If any sanctions could be imposed

## Notification of a Report

Should an investigation be determined, then a notification will be sent to the complainant and the accused that a code of conduct violation report has been filed and the steps involved in the process. Additionally, a copy of the code of conduct will be provided as a reference. If no action is determined necessary, then the report will stay on file for future reference should the need arise. The notification will occur in no less than 10 college days from the day the report is filled with the Office of the Dean of Students.

## Acceptance of Incident

Students accused of a code of conduct violation have the right to the conduct process. However, should the accused student accept responsibility for the alleged code of conduct violation, they can waive their right to a hearing and all associated procedures and accept their sanction(s) from the Conduct Officer. A written notification will be sent to the accused detailing the outcome of the meeting, sanctions imposed, and the appeal process.

## Notification of a Conduct Meeting

The accused student will receive a notification of a conduct meeting. The notice will include:

- Date
- Time
- Location of the meeting
- A copy of the code of conduct with the specific violation highlighted

If the student fails to appear for the meeting, then the conduct process continues and a decision will be made with all available evidence.

During the meeting, the accused has the ability to explain the events as they remember or turn in any additional evidence. The meeting is between the accused and the Conduct Officer. Other attendees, either at the same meeting or at different times may include; faculty, staff, the complainant, or other students with pertinent information. With consent from the student, all meetings may be audio recorded and recordings become property of the College.

After the Conduct Meeting is held and all evidence is collected and reviewed, the Conduct Officer will determine if it is more likely than not that a violation of the code of conduct occurred. The College uses the preponderance of evidence for determining the outcome of all conduct report investigations. In other words: is it more likely than not that a violation occurred? A written notification will be sent to the accused detailing the outcome of the meeting, sanctions imposed, and the appeal process.

## Notification of a Conduct Hearing and Hearing Guidelines

In some circumstances and/or due to the severity or complexity of the incident, the Conduct Officer may determine that the violations require

a disciplinary hearing. The hearing allows for the accused to state the events as they remember or bring any additional evidence.

The Conduct Officer may assemble a conduct panel to complement the adjudication process. The Conduct Panel recommends an outcome to the Conduct Officer. With the student's consent, all hearings may be audio recorded with recordings become property of the College.

**Conduct Panel:** A conduct panel may include members of the following groups:

- College staff
- College faculty
- Members of the President's cabinet
- Members of the Academic Deans Council
- The student body
  - When students are permitted on the panel, the accused should sign a consent to release educational records to the student(s) serving on the panel. Failure to sign the consent creates an agreement that no student shall be on the panel.

The accused student will receive a notification of a conduct hearing from the Conduct Officer. The notice will include:

- Date of the hearing
- Time of the hearing
- Location of the hearing
- Whether there will be a conduct panel present
- A copy of the code of conduct for reference.

## Hearing Guidelines

- The accused will receive advanced notice of the allegations and the reason for the hearing. The accused may choose to not attend the hearing, in such cases the conduct panel will continue to make their decision based on all evidence available.
- This is a college conduct hearing that is held in private and is not a legal hearing.
- Student(s) may bring someone (family member, friend, etc.) to accompany them to the hearing for support. The Conduct Officer has the right to decide who has entry to the hearing. Any disruptions to the hearing by any person may result in immediate removal from the hearing.
- The Conduct Panel has the ability to listen to any person associated with the event, and/or has pertinent information about the event, or people involved in the event. Additionally, the panel has access to all evidence such as videos, captured social media posts, incident reports, and academic history. The Conduct Panel may ask for more evidence or information regarding the event.
- As in all conduct violation allegations, the Conduct Panel will use the preponderance of evidence for determining the outcome of all conduct investigations. This decision will be communicated to the Conduct Officer in writing.
- After the hearing, a written notification will be sent to the accused detailing the outcome of the hearing, sanctions imposed, and the appeal process, if any.

## Administrative Interim Suspension

In some conduct investigations, students may be placed on an interim suspension. An interim suspension is not considered a conduct decision

but, rather, a measure to ensure the normal operation of the College. An interim suspension may occur:

- When there appears to be an immediate threat to the physical or emotional safety of students, staff, faculty, college property, or another member of the larger civil community
- When there appears to be an immediate threat to the free movement of any member of the college community
- For no longer than 2 weeks

## Non-Retaliation Clause

Throughout the conduct process retaliation is strictly prohibited. This includes, but is not limited to, behavior that is perceived as or is threatening, abusive, hateful, or otherwise intended to seek harm on another individual involved in the conduct process with the intention to reduce their representation in such process. A separate conduct case will be initiated to investigate any accusation of retaliation with compounding sanctions.

## Conduct Offensives

The following is given only as a list of examples. The College may also sanction other behavior not listed below:

- **Abuse of the code of conduct:** Behavior that is intended to use the code of conduct for another purpose with the intent to manipulate or disrupt the college policy or cause harm on another person.
- **Academic dishonesty:** Behavior such as cheating, plagiarism, falsifying data, or deception within the learning environment. Please see syllabi for Academic Program specific information.
- **Classroom disruptions:** Behavior in the classroom, lab, or during off site learning engagements that is considered inappropriate, disrupts the normal operation of the learning environment, and/or non-compliant with professional standards.
- **Destruction of college property, vandalism:** Damage, destruction, or altering college property. Defacing college property with offensive graffiti, slogans or any other alteration of college property meant to disparage or intimidate others.
- **Disorderly conduct:** Behavior that is considered obstructive or disruptive that interferes with normal college operations or inappropriate acts of disobedience towards college staff or faculty such as failure to comply with emergency procedures.
- **Falsification:** Deliberately providing incorrect, false, or misleading information to the college with the intention to harm, mislead, defraud, or gain an advantage.
- **Hazing:** Any behavior that is perceived as threatening or endangers a student or physical property for initiation into or affiliation with any student club, group, or professional organization.
- **Illegal or unauthorized possession or use of drugs or alcohol:** The College prohibits the possession, use, or distribution of illegal drugs, narcotics, and alcohol on school property or as part of any school activity, regardless of location.
- **Rioting:** The assembly of three or more people with the intention to disrupt the normal operation of the College. This includes, but is not limited to, behavior that is perceived as or is threatening, property damage, chanting offensive slogans or any other action meant to disparage or intimidate others, blocking of emergency exits or other emergency services, or insubordination of an official college direction.
- **Sexual assault (reference Title IX section):** Behavior that is in violation of our “Sexual Misconduct” policy. Please see, “Sexual Misconduct” policy on page 28 of this handbook.
- **Student appearance:** Clothing should be appropriate for the work being performed. Students are expected to maintain a neat, clean appearance. Students should not wear any clothing that may be deemed offensive, i.e. wearing or displaying, while on campus, any symbols that are designed to, or have the effect of, harassing, demeaning, intimidating, or disparaging any legally protected minority.
  - **Safety wear:** Students in clinical, internship, shop and laboratory classes should wear clothing typical of the field of work. Shop coats, aprons, coveralls or other protective garments are recommended for many courses. Students are responsible for providing personal safety wear required in some courses, such as protective goggles, earplugs, gloves, and hard hats. Items purchased elsewhere must meet applicable state and federal requirements. Caps or hairnets, which fully restrain long hair, may also be required in certain work environments. Faculty will provide students with a list of safety items necessary for the learning environment.
- **Technology:** Any violation to the College’s Technology Policies, please see page 19 of this handbook, including, but not limited to the following:
  - Use Dunwoody-owned/supplied communications system, such as e-mail or voicemail, to threaten, intimidate, or harass others. Use Dunwoody-owned/supplied systems or content for the distribution of political campaign materials or for financial gain, whether personal or commercial, including spam, chain letters, solicitation of business or services, sales of property, etc.
  - Abuse of email systems including spoofing sender addresses, forging the identity of a user or machine in an e-mail message, and/or sending unauthorized all-campus email messages.
  - Create, store, process, browse, or display any racially- offensive, gender-offensive or likewise obscene material including pornography.
  - Consume network or computer resources to the exclusion of another’s use. or example: overloading the network with legitimate (i.e., file backup, videos, etc.) or illegitimate (i.e., denial of service attack) activities.
  - Attach any device or computer not owned or supplied by Dunwoody to the campus network without prior authorization.
  - Post or transmit Dunwoody’s confidential materials, policies, or procedures on websites, electronic bulletin boards, chat rooms, and/or other publicly accessible digital media, which violate existing laws, regulations, or Dunwoody’s policies or codes of conduct.
- **Theft:** The act of taking property or goods from another person, college facility, or student organization without consent.
- **Threatening, violent, or aggressive behavior:** Any physical, mental, or verbal behavior that is perceived as threatening or endangers the health, safety, and wellness of another individual; the normal operation of the college or college facilities; or that is perceived as promoting or promotes hatred, violence or prejudice within our community or towards another individual or group. Chanting offensive slogans or any other action meant to disparage or intimidate others.
- **Unauthorized use or misuse of college facilities:** Inappropriate use of college facilities such as labs, property, or technology. Unauthorized



entry into college facilities including databases, college property, or storage locations.

- **Violation of college rules / guest behavior:** Behavior that would constitute a violation of any college policies, procedures, or rules. Students are responsible for the behavior and actions of their guests.
- **Violation of laws:** Any behavior that violates city, state, county, local, or federal laws.
- **Weapons and fireworks:** Weapons, objects perceived as weapons, or dangerous articles are not allowed on college property or at a college sponsored activity. This includes, but not limited to, swords, guns, pellet guns, incendiary devices, explosives or dangerous chemical/biological agents. Fireworks are not allowed on college property.

## Sanctions

The following sanctions may be imposed on any student or student organization found to be in violation of the code of conduct or any other college policy. The sanction will be in relation to the violation as more severe or pervasive violations will result in more severe sanctions. The following list is not exclusive as other sanctions may be imposed that fit within the guiding principles of this policy.

The following sanctions may include additional conditions such as a reflection activity, restitution of financial damages, mental health counseling, meeting with staff on a rotating basis, removal of college property, failing an academic course, or pursuing legal actions.

- **Warning:** A written or verbal notification to a student that their behavior has violated the code of conduct.
- **Probation:** The conditions of the probation are based on the intensity of the violation. While on probation, if the student violates another college policy or does not follow the stipulations of the probation, then they may be suspended from the College. The probation notification explains: the stipulations of the probation, the length of the suspension, assigned probation conditions, appeal options, and an explanation that any further violation of the code of conduct or failure to follow the stipulations of the probation may result in immediate suspension from the college.
- **Suspension:** A suspension means that the violation was severe enough to involuntarily separate the student from the College for a certain length of time. The suspension notification explains the stipulations of the suspension, the length of the suspension, assigned suspension conditions, appeal options, and college reentry conditions.
- **Expulsion:** An expulsion means that the violation was severe enough to permanently and involuntarily separate the student from the College. The notification explains the stipulations of the expulsion and the assigned expulsion conditions.

## Appeal Procedure

A sanction imposed by the Conduct Officer may be appealed by the complainant or accused student. For housing students, the appeal must be delivered to the Dean of Students, Kelli Sattler, [ksattler@dunwoody.edu](mailto:ksattler@dunwoody.edu), within 10 days of receipt of the sanction notification. For all other students, the appeal must be delivered to the Provost office, Jeff Ylinen, [jylinen@dunwoody.edu](mailto:jylinen@dunwoody.edu) (<https://catalog.dunwoody.edu/catalog-student-handbook/student-rights-responsibilities/student-code-conduct/jylinen@dunwoody.edu>), within 10 days of receipt of the sanction notification. Appeals are only based on the following:

- Concerns over due process during the conduct process
- Inappropriate or arbitrary sanctions
- New evidence has become available that was not available during the conduct process

The Dean of Students may form an Appeals' Committee consisting of the Provost, the appropriate Academic Dean and/or Program Manager, and the Dean of Students being the chair of the committee for a minimum of three members. The Appeals' Committee may conduct a new hearing or review any materials including recordings from the initial conduct process. Additionally, they may start a brand new conduct investigation. The decision of the Appeals' Committee is final and cannot be overturned, altered, or dismissed.

## Housing

The code of conduct applies to all residents living in our housing facility. Please see our Housing Policy section (p. 177) for more detailed information. Any questions can be directed to John Richardson, Associate Dean of Students, [jrichardson@dunwoody.edu](mailto:jrichardson@dunwoody.edu) (<https://catalog.dunwoody.edu/catalog-student-handbook/student-rights-responsibilities/student-code-conduct/jrichardson@dunwoody.edu>).

# Student Right To Know

## A Statistical Overview

Dunwoody College of Technology, in an effort to provide institutional transparency to our stakeholders, has posted on [dunwoody.edu/about/facts](https://dunwoody.edu/about/facts) institutional statistics outlining retention rates, graduation rates, placement rates, student to faculty ratio, and other data which demonstrates the characteristics of the stakeholders we serve and the quality of service Dunwoody provides.

Federal law requires colleges and universities to provide certain information to current and prospective students and their parents. In order to facilitate that disclosure, Dunwoody provides the following Student Right to Know information (<https://dunwoody.edu/about/accountability/student-right-to-know>).

# Unlawful Harassment and Sexual Conduct Policy

## Notice of Non-Discrimination

Dunwoody (also referred to as "the College") is committed to maintaining a learning and working environment free from discrimination and intimidation, including harassment and sexual misconduct. The College's mission is best accomplished in an atmosphere of professionalism which, in turn, is supported by mutual respect and trust. Dunwoody expects all students and employees and others doing business with Dunwoody to work toward this goal.

This Policy outlines Dunwoody's community expectations to ensure a campus free from sexual misconduct, the steps for recourse for those individuals whose rights have been violated, and the procedures for determining a violation of University policy. The Policy applies to the following forms of sex discrimination, which are referred to collectively as "sexual misconduct": sexual harassment, sexual assault, domestic violence, dating violence, stalking, and sexual exploitation.

In accordance with applicable federal and state laws, such as Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education

Amendments of 1972, the Age Discrimination in Employment Act, and the Americans with Disabilities Act and ADA Amendments, Dunwoody does not discriminate on the basis of sex, race, color, national origin, religion, age, disability, marital status, familial status, pregnancy, citizenship, creed, genetic information, veteran status, status with regard to public assistance, membership in a local human rights commission, or any other legally protected status in its education programs and activities, employment policies and practices, or any other areas of the College.

Sex discrimination is prohibited by Title IX of the Education Amendments of 1972, which provides that: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." Sex discrimination is conduct based upon an individual's sex that excludes an individual from participation, denies the individual the benefits of, treats the individual differently, or otherwise adversely affects a term or condition of an individual's employment, education, living environment or participation in a program or activity. Sexual harassment is a form of sex discrimination.

Dunwoody strictly prohibits sexual discrimination and sexual harassment in any form. The College will promptly and equitably respond to all reports of sexual discrimination and harassment.

Questions or concerns about the application of Title IX, sex discrimination, sexual harassment, or other forms of sexual misconduct may be directed to the College's Title IX Coordinator.

Carla Pogliano Connor, Ph.D.  
Title IX Coordinator  
Vice Provost for Program Development and Compliance  
612-381-8236  
Office: Silver Level  
cc Connor@dunwoody.edu (cpogliano@dunwoody.edu)

Questions or concerns may also be directed to the U.S. Department of Education's Office for Civil Rights:

The Office of Civil Rights  
U.S. Department of Education  
Citigroup Center  
500 W. Madison St., Ste. 1475  
Chicago, IL 60661-4544  
Telephone: 312-730-1560  
TDD: 877-521-2172  
Email: OCR.chicago@ed.gov  
<http://www.ed.gov/ocr>

## Scope of Policy

This policy applies to sexual harassment, sexual assault, stalking, dating violence, domestic violence, and sexual exploitation (referred to collectively as "sexual misconduct").

This policy applies to all Dunwoody community members, including students, employees, faculty, administrators, staff, applicants for admission, and third parties such as trustees, volunteers, vendors, independent contractors, visitors, and any individuals and entities that do business with Dunwoody regularly or temporarily employed, studying, living, visiting, conducting business or having any official capacity with Dunwoody or on Dunwoody property. All Dunwoody community members are required to follow Dunwoody policies and local, state, and federal law.

This policy applies regardless of the sexual orientation or gender identity of any of the parties.

This policy applies to any conduct that may adversely impact an employee's work and/or a student's or other person's participation in the College's educational and extra-curricular programs or other programs and activities. This policy applies to sexual misconduct committed by or against a Dunwoody community member, including conduct occurring on campus or Dunwoody property, conduct that occurs at Dunwoody-sanctioned events or programs that take place off campus, such as study abroad and internships, and off campus conduct that may cause or threaten to cause an unacceptable disruption at the College or which may interfere with an individual's right to a non-discriminatory educational or work environment. Violation of this policy will lead to discipline, up to and including termination of employment for employees, expulsion or suspension from Dunwoody for students, or prohibition from doing business with Dunwoody and exclusion from Dunwoody's campus for volunteers and third parties.

## Definitions

### Victim

Refers to an individual who is alleged to have been subject to conduct that violates this policy.

### Accused

Refers to an individual who has been accused of prohibited conduct under this policy.

### Complainant

Refers to the individual filing a complaint with the College under the Sexual Misconduct Policy. The complainant will be the person who alleges that they have been subjected to sexual misconduct. In addition, the term "complainant" may also be used to refer generally to persons alleged to have been subjected to conduct that violates this policy, whether or not they have filed a complaint.

### Respondent

Refers to the individual named as the accused in a complaint resolution process with the College under the Sexual Misconduct Policy.

### Third Party

Refers to any other participant in the process, including a witness to the incident or an individual who makes a report on behalf of someone else.

### A Report

Is an account of the sexual misconduct that has allegedly occurred that could be provided to the College by the complainant, a third party, or an anonymous source.

### A Complaint

Is an alleged policy violation that begins a complaint resolution process as set forth in the Procedures for Sexual Misconduct Complaint Resolution.

### Sexual Misconduct

Prohibited by this policy means the following forms of sex discrimination and other misconduct: sexual harassment, sexual assault, stalking,<sup>1</sup> domestic violence, dating violence, and sexual exploitation.

## Sexual Harassment

Is a form of sex discrimination and includes unwelcome conduct of a sexual nature, including sexual advances, requests for sexual favors, sexually motivated physical contact or other verbal or physical conduct or communication of a sexual nature, when submission to such conduct, either explicitly or implicitly:

- is a condition of employment or educational experience; or
- is a basis for an employment, academic, or other educational decision; or
- substantially and unreasonably interferes with job performance or educational experience; or
- creates an intimidating, hostile, or offensive employment or educational environment.

Harassment of a sexual nature or based on sex is prohibited regardless of whether it is committed by a man or woman and regardless of whether it is targeted at a member of the same sex or a member of the opposite sex. Sexual harassment includes any sexual or gender-based verbal, written, or physical conduct that is unwanted and is sufficiently severe, pervasive/persistent, and clearly/objectively offensive such that it unreasonably interferes with or deprives someone of academic, social or work-related access, benefits, or opportunities in the College community or creates an environment that interferes with the wellbeing and/or success of an individual. Dunwoody prohibits sexual harassment in any form, including verbal, physical, and visual harassment. Some examples of conduct that may be sexual harassment under this policy include but are not limited to:

- Unwelcome sexual flirtations, advances, or propositions;
- Requests for sexual favors;
- Punishing or threatening to punish a refusal to comply with a sexual-based request;
- Offering a benefit (such as a grade, promotion, or athletic participation) in exchange for sexual favors or other verbal or physical conduct of a sexual nature;
- Verbal abuse of a sexual nature, obscene language, gender- or sexually-oriented jokes, verbal commentary about an individual's body, sexual innuendo, and gossip about sexual relations;
- The display of derogatory or sexually suggestive posters, cartoons, drawings, or objects, or suggestive notes or letters or e-mails or text messages or in a public space;
- Visual conduct such as leering or making gestures;
- Sexually suggestive comments about an individual's body or body parts, or sexual degrading words to describe an individual;
- Unwanted kissing;
- Unwelcome touching of a sexual nature such as patting, pinching, or brushing against another's body;
- Unwelcome verbal or physical conduct against an individual related to the individual's gender identity or the individual's conformity or failure to conform to gender stereotypes;
- Cyber or electronic harassment.

## Unwelcome Conduct

Conduct is unwelcome when the individual did not request or invite it and regarded the conduct as undesirable or offensive. The fact that an individual may have accepted the conduct does not mean that he or she welcomed it. On the other hand, if an individual actively participates in conduct and gives no indication that he or she objects, then the evidence generally will not support a conclusion that the conduct was unwelcome.

That a person welcomes some conduct does not necessarily mean that person welcomes other conduct. Similarly, that a person willingly participates in conduct on one occasion does not necessarily mean that the same conduct is welcome on a subsequent occasion. Whether conduct was unwelcome may be determined based on the context and circumstances of the encounter or incident, including various objective and subjective factors.

## Sexual Exploitation

Occurs when a person takes sexual advantage of another person for the benefit of anyone other than that person without that person's consent. Examples of sexual exploitation include, but are not limited to:

- Intentional and repeated invasion of sexual privacy (e.g., walking into the other person's room or private space);
- Prostituting another person;
- Taking of or distribution of photographs/images, video or audio recording, or electronically broadcasting (e.g., with a web cam) a sexual activity;
- Intentional removal or attempted removal of clothing covering an individual intimate parts;
- Intentionally allowing others to view/hear a sexual encounter (such as letting individuals hide in the closet or watch consensual sex);
- Viewing or permitting someone else to view another's sexual activity or intimate body parts, in a place where that person would have a reasonable expectation of privacy;
- Engaging in voyeurism;
- Exposing one's genitals or breasts;
- Inducing another to expose his or her genitals or breasts;
- Knowingly transmitting a sexually transmitted disease or sexually transmitted infection to another person without his or her knowledge;
- Forcing others to view pornography.

## Sexual Assault

Is any actual or attempted sexual contact, with any object, with another person without that person's consent. As used in this policy, sexual contact includes intentional contact by the accused with the victim's intimate parts (genital area, groin, inner thigh, buttocks, or breasts), whether clothed or unclothed; coerced touching by the victim of another's genital area, groin, inner thigh, buttocks, or breasts, whether clothed or unclothed; or forcing another to touch oneself with or on any of these body parts. Sexual assault includes but is not limited to an offense that meets any of the following definitions:

- Rape: the penetration, no matter how slight, of the vagina or anus with any body part or object, oral penetration by a sex organ of another person, or oral contact with the sex organ of another person, without the consent of the victim.
- Fondling: the touching of the intimate parts (genital area, groin, inner thigh, buttocks, or breast) of another person for the purpose of sexual gratification, without the consent of the victim.
- Incest: sexual intercourse between persons who are related to each other within the degrees wherein marriage is prohibited by law.
- Statutory rape: sexual intercourse with a person who is under the statutory age of consent; in Minnesota, the age of consent is 16.

Sexual assault also is prohibited by Minnesota law. See Minnesota Statutes Section 609.341 et seq. for applicable criminal law definitions of criminal sexual conduct. Links to Minnesota statutes concerning

sexual violence can also be found at <http://www.mncasa.org/mn-sexual-violence-laws>.

## Consent

Is words or overt actions by a person clearly communicating a freely given present agreement to perform a particular sexual act. Consent must be informed and freely and actively given. Words or overt actions clearly communicate consent when a reasonable person in the circumstances would believe those words or actions indicate a willingness to participate in a mutually agreed-upon sexual activity. Although consent does not need to be verbal, verbal communication is the most reliable form of asking for and obtaining consent. It is the responsibility of the person initiating the specific sexual activity to obtain consent for that activity.

In cases of alleged sexual assault or other sexual misconduct, Dunwoody applies the legal definition of consent as well as the principles listed below in determining whether an actor consented to a particular act:

- The use or threatened use of force or other forms of coercion take away a person's ability to give consent to sexual contact.

## Coercion

Is conduct or intimidation that would compel an individual to do something against their will by the use of unreasonable pressure, physical force, or threats of severely damaging consequences that would reasonably place an individual in fear of immediate or future harm. Coercion is more than an effort to persuade or attract another person to engage in sexual activity. Coercive behavior differs from seductive behavior based on the degree and type of pressure someone uses to obtain consent from another.

- Consent is not present simply because a party was silent or failed to resist a particular sexual act. Consent is active, not passive. Silence or the absence of resistance or saying "no," in and of themselves, cannot be interpreted as consent.
- A person who is incapacitated, whether by drugs, alcohol, sleep, or other means, cannot consent to a sexual act. This is true regardless of whether the person voluntarily or involuntarily consumed the drugs or alcohol.

## Incapacitation

means the physical and/or mental inability to understand the fact, nature, or extent of the sexual situation. Incapacitation may result from mental or physical disability, sleep, unconsciousness, involuntary physical restraint, or from the influence of drugs or alcohol. With respect to incapacitation due to the influence of drugs or alcohol, incapacitation requires more than being under the influence of drugs or alcohol; a person is not incapacitated just because they have been drinking or using drugs. Where drugs and/or alcohol are involved, incapacitation is determined based on the facts and circumstances of the particular situation looking at whether the individual was able to understand the fact, nature, or extent of the sexual situation, whether the individual was able to communicate decisions regarding consent, non-consent, or the withdrawal of consent, and whether such condition was known or reasonably known to the respondent or a reasonable sober person in respondent's position.

Use of drugs or alcohol by the accused is not a defense against allegations of sexual misconduct and does not diminish personal

responsibility. It is the responsibility of the person initiating the specific sexual activity to obtain consent for that activity.

- Consent to one sexual act does not, by itself, constitute consent to another. Consent has to be specific to the act.
- Consent to engage in sexual activity with one person does not imply consent to engage in sexual activity with another.
- An existing sexual, romantic, or marital relationship does not imply consent.
- Previous relationships or previous consent do not, by themselves, constitute consent to future sexual acts. In cases of prior relationships, the manner and nature of prior communications between the parties and the context of the relationship may be factors in determining whether there was consent.
- Whether an individual actively and willingly participates in conduct may be a factor in determining whether there was consent.
- Consent can be withdrawn at any time. When consent is withdrawn, the sexual activity for which consent was initially provided must stop.
- A person who is not of legal age (16 in Minnesota) cannot consent to sexual activity.

## Dating Violence

is violence committed by a person who is or has been in a social relationship of a romantic or intimate nature with the victim. The existence of such a relationship shall be determined based on the statement of the individual alleging the dating violence with consideration of the following factors: (i) the length of the relationship; (ii) the type of relationship; and (iii) the frequency of interaction between the persons involved in the relationship. Dating violence includes, but is not limited to, sexual or physical abuse, such as physical harm, bodily injury, or criminal assault, or the threat of such abuse. Dating violence does not include acts covered under the definition of domestic violence.

Dating violence also is prohibited by Minnesota law. Minnesota law prohibiting domestic abuse includes physical harm, bodily injury, or assault committed between persons involved in a significant romantic or sexual relationship. See Minnesota Statutes Section 518B.01.

## Domestic Violence

Is a felony or misdemeanor crime of violence committed by:

- A current or former spouse or intimate partner of the victim.
- A person with whom the victim shares a child in common.
- A person who is a current or former cohabitant of the victim as a spouse or intimate partner.
- A person similarly situated to a spouse of the victim under Minnesota's domestic or family violence law.
- Any other person against an adult or youth victim who is protected from that person's acts under applicable domestic or family violence laws of Minnesota (or, if the crime occurred outside of Minnesota, the jurisdiction in which the crime of violence occurred). In addition to the relationships described above, Minnesota law defines domestic violence to include violence committed between parents and children, blood relatives, persons who are presently residing together or who have resided together in the past, persons who have a child together, persons involved in a significant romantic or sexual relationship, and a man and woman, if the woman is pregnant and the man is alleged to be the father.



Domestic violence also is prohibited by Minnesota law. See Minnesota Statutes Section 518B.01 for applicable criminal law definitions relating to domestic violence. While not exhaustive, the following are examples of conduct that can constitute domestic violence: (1) physical harm, bodily injury or assault; (2) the infliction of fear of imminent physical harm, bodily injury, or assault; or (3) terroristic threats, criminal sexual conduct, or interference with an emergency call.

## Stalking

Is engaging in a course of conduct directed at a specific person that would cause a reasonable person to fear for her, his or other people's safety, or to suffer substantial emotional distress.

- **Course of conduct** means two or more acts, including, but not limited to, acts in which the stalker directly, indirectly, or through others (by any action, method, device, or means), follows, monitors, observes, surveils, threatens, or communicates to or about a person or interferes with a person's property.
- **Reasonable person** means a reasonable person in the victim's circumstances.
- **Substantial emotional distress** means significant mental suffering or anguish that may, but does not necessarily, require medical or professional treatment or counseling.

Stalking behavior may include, but is not limited to:

- Repeated, unwanted and intrusive communications by phone, mail, text message, and/or email or other electronic communications, including social media;
- Repeatedly leaving or sending the victim unwanted items, presents, or flowers;
- Following or lying in wait for the victim at places such as home, school, work, or recreational facilities;
- Making direct or indirect threats to harm the victim, or the victim's children, relatives, friends, or pets;
- Damaging or threatening to damage the victim's property;
- Repeatedly posting information or spreading rumors about the victim on the internet, in a public place, or by word of mouth, that would cause a person to feel threatened or intimidated;
- Unreasonably obtaining personal information about the victim.

Stalking is also prohibited by Minnesota law. See Minnesota Statutes Section 609.749 for applicable definitions of criminal stalking.

## Retaliation

Is any materially adverse action, or threat thereof, taken against a person for making a good faith report or complaint of a potential policy violation, supporting another person's report, responding in good faith to a complaint, or participating in good faith in an investigation of a complaint or the complaint resolution process, or opposing in good faith a practice or conduct that the person reasonably believes is in violation of this policy. Retaliatory acts may include, but are not limited to: acts or comments that are intended to discourage a person from engaging in activity protected under this Policy or that would discourage a reasonable person from engaging in activity protected under this Policy; adverse changes in employment status or opportunities; adverse academic action; adverse changes to academic, educational and extra-curricular opportunities; harassment; intimidation; acts or comments intended to embarrass the individual; and seeking to influence the participation or statements of parties or witnesses, or taking adverse action against them. Retaliatory conduct is prohibited regardless of whether it occurs

on or off campus, in person, or through social media, e-mail, or other form of communication, or whether it is committed by parties to the complaint resolution process, their friends or representatives, or any other person.

Retaliation may be present against a person even when the person's allegations of prohibited conduct are not substantiated.

## Responsibilities of Title IX Coordinator and Title IX Team

Dunwoody's Title IX Coordinator is:

Carla Pogliano Connor, Ph.D.

Vice Provost for Program Development and Compliance

612-381-8236

Office: Silver Level

cconnor@dunwoody.edu (cpogliano@dunwoody.edu)

The Title IX Coordinator is the designated representative of the College with primary responsibility for coordinating Dunwoody's Title IX compliance efforts, including Dunwoody's efforts to end sexual misconduct, prevent its recurrence, and address its effects. The Title IX Coordinator oversees and monitors Dunwoody's overall compliance with Title IX-related policies and developments; the implementation and oversight of grievance processes and procedures, including notification, investigation and adjudication of complaints; provision of educational materials and training for the campus community; and monitoring all other aspects of the college's Title IX compliance. These responsibilities (which may be carried about by the Title IX Coordinator or the Title IX Coordinator's designee) include, but are not limited to:

- Ensuring Dunwoody policies and procedures and relevant state and federal laws are followed;
- Advising any individual, including a complainant, a respondent or a third party, about the procedural options and processes used by Dunwoody and about resources available at Dunwoody and in the community;
- Training and assisting Dunwoody employees regarding how to respond appropriately to a report of sex discrimination, sexual harassment, sexual assault, stalking, domestic violence, dating violence, or sexual exploitation;
- Monitoring full compliance with all procedural requirements and time frames outlined in this policy;
- Evaluating allegations of bias or conflict of interest relating to the procedures outlined in this policy;
- Determining whether grounds for appeal under this policy have been stated;
- Ensuring that appropriate training, prevention and education efforts, and periodic reviews of climate and culture take place;
- Coordinating Dunwoody's efforts to identify and address any patterns or systemic problems revealed by reports and complaints; and
- Assisting in answering any other questions related to this policy.

Dunwoody's Title IX Team includes: Kelli Sattler, Dean of Students, Patricia Edman, Vice President of Human Resources, and Mike White, Dean of Applied Management, Computer Technology, Health Sciences, Design and Graphics Technology. These team members have a shared responsibility for consulting with and supporting the Title IX Coordinator and may serve as the Coordinator's designee(s). Members of the team may also be called upon to investigate complaints of sexual misconduct, resolve complaints, review appeals, and/or facilitate informal resolutions to conflicts or complaints.

## Confidentiality

The College is committed to protecting the privacy of individuals involved in a report of sexual misconduct. The College will protect a victim's confidentiality to the extent possible even if the complainant does not specifically request confidentiality. Dunwoody encourages individuals who have experienced sexual misconduct to talk to someone about what happened. Privacy and confidentiality have distinct meanings under this policy. Different people on campus have different legal reporting responsibilities, and different abilities to maintain privacy or confidentiality, depending on their roles at Dunwoody.

In making a decision about whom to contact for support and information, it is important to understand that most Dunwoody employees are not confidential resources, and are therefore obligated to report to Dunwoody any information they receive about sexual misconduct. Persons who have experienced sexual misconduct are encouraged to consider the following information in choosing whom to contact for information and support.

In addition, although the College will strive to protect the privacy of all individuals involved to the extent possible consistent with the College's legal obligations, the College may be required to share information with individuals or organizations outside the College under reporting or other obligations under federal and state law, such as reporting of Clery Act crime statistics and mandatory reporting of child abuse and neglect. In addition, if there is a criminal investigation or civil lawsuit related to the alleged misconduct, the College may be subject to a subpoena or court order requiring the College to disclose information to law enforcement and/or the parties to a lawsuit. In these cases, personally identifying information will not be reported to the extent allowed by law and, if reported, affected students will be notified consistent with the College's responsibilities under FERPA, as allowed by law.

## Confidential Resources

Confidential communications are those communications which cannot be disclosed to another person, without the reporter's consent, except under very limited circumstances such as allegations involving the physical or sexual abuse of a child (under the age of 18) or vulnerable adult or an imminent threat to the life of any person. Dunwoody recognizes that some individuals may wish to keep their concerns confidential. Individuals who desire the details of sexual misconduct to be kept confidential should speak with a medical professional, professional counselor, minister or other pastoral counselor, or trained victims' advocate. These resources can be found in the Resource section of this policy.

A person who speaks to a confidential resource should understand that if the person does not report the concern to Dunwoody, Dunwoody will be unable to conduct an investigation into the particular incident or pursue disciplinary action.

## Non-Confidential Communications

Non-confidential communications are those communications with any Dunwoody employee who is not a confidential resource as identified above. Only confidential resources can promise confidentiality. All other Dunwoody employees who become aware of incidents or allegations of sexual misconduct have a responsibility to report the matter to the Title IX Coordinator. Allegations of policy violations will be considered private and will only be shared with other Dunwoody employees on a need to know basis. The allegations will not be shared with law enforcement without the consent of the individual who has alleged the

sexual misconduct, unless the allegations relate to physical abuse, sexual abuse, or neglect of a child under the age of 18 (see the Mandatory Reporting Concerning Minors section below for more information) or unless Dunwoody is compelled to do so pursuant to a subpoena or court order.

College employees who are not confidential resources will strive to remind an individual of their reporting obligations before the individual has disclosed a situation that requires reporting to the Title IX Coordinator.

## Requests for Confidentiality or Non-Action

When Dunwoody receives a report of sexual misconduct, it has a legal obligation to respond in a timely and appropriate manner. Making a report to Dunwoody does not require an individual to begin or participate in a complaint resolution process or to report to local law enforcement. However, based on the information gathered, Dunwoody may determine that it has a responsibility to move forward with the complaint resolution process (even without the participation of the individual who has alleged the sexual misconduct). In a situation in which the individual requests that their name or other identifiable information not be shared with the accused, or that no action be taken against the accused, Dunwoody will evaluate the request considering the following factors: the seriousness of the alleged misconduct, the respective ages and roles of the individual who has alleged the sexual misconduct and the accused, whether there have been other sexual misconduct complaints about the same alleged respondent, whether the alleged respondent has a history of arrests or records from a prior school indicating a history of violence, whether the alleged respondent threatened further sexual misconduct or other violence against the complainant or others, or whether the sexual misconduct was committed by multiple respondents, whether the sexual misconduct was perpetrated with a weapon, whether Dunwoody possesses other means to obtain relevant evidence of the sexual misconduct (e.g., security cameras or personnel, physical evidence), whether the report reveals a pattern of perpetration (e.g., via illicit use of drugs or alcohol) at a given location or by a particular group, the College's ability to conduct an investigation without revealing identifiable information, and the extent of any threat to the Dunwoody community.

In instances where the College moves forward with a complaint resolution process without the participation of the individual who has alleged the sexual misconduct, the individual who is alleged to have been subject to the misconduct will have the same rights as provided to a complainant under this Policy even if the individual is not named as a complainant.

Dunwoody will take all reasonable steps to investigate and respond to the complaint consistent with the request for confidentiality or request not to pursue an investigation made by the individual who has alleged the sexual misconduct, however, the scope of the response by Dunwoody may be impacted or limited based on the nature of the individual's request. The Title IX Coordinator may determine that the individual's request for confidentiality or no action cannot be honored. The presence of one or more of the factors above could lead Dunwoody to move forward with a complaint resolution process (even without the participation of the individual who has alleged the sexual misconduct).

In this instance, the Title IX Coordinator or designee will inform the individual about the chosen course of action, which may include an investigation of the incident(s) reported and may, at the individual's request, communicate to the accused that the individual asked

Dunwoody not to investigate and that Dunwoody determined it needed to do so. Alternatively, action could include steps to limit the effects of the alleged misconduct and prevent its recurrence that do not involve an investigation or formal disciplinary action against the accused or reveal the identity of the individual who has alleged the sexual misconduct. In order to protect the rights and safety of this community, Dunwoody reserves the right to take whatever measures deemed necessary in response to an allegation of sexual misconduct. While Dunwoody cannot guarantee confidentiality, it will strive to accommodate the individual's requests to the extent possible consistent with the legal obligations of Dunwoody to respond appropriately to reports.

## Clery Act Reporting and Timely Warning

Pursuant to the Clery Act, Dunwoody includes statistics about certain offenses in its annual security report and provides those statistics to the United States Department of Education and Minnesota Office of Higher Education in a manner that does not include any personally identifying information about individuals involved in an incident. In addition, the Clery Act requires Dunwoody to issue a crime alert (timely warning) to the campus community about certain reported offenses which may represent a serious or continuing threat to students and employees. If Dunwoody determines that the alleged respondent(s) poses a serious and immediate threat to the Dunwoody community, Campus Security may be called upon to issue a timely warning to the community. The timely warning may include that an incident has been reported, general information surrounding the incident, and how incidents of a similar nature might be prevented in the future. The timely warning will not include any identifying information about the individual who has alleged the sexual misconduct. In addition, publicly available recordkeeping, including Clery Act reporting and disclosures such as the annual security report and daily crime log, will not include names or other information that may personally identify either party, to the extent permitted by law. To ensure that a victim's personally identifying information will not be included in publicly available recordkeeping, the Title IX Coordinator describes the alleged incidents by removing the victim's and accused's names and any other identifiers that would enable the public to identify either party in the context of the incident report. All Dunwoody processes are conducted in compliance with the requirements of FERPA, the Clery Act, Title IX, and state and federal law. No information shall be released from such processes except as required or permitted by law and Dunwoody policy.

Minnesota law requires institutions to collect statistics, without inclusion of any personally-identifying information, regarding the number of reports of sexual assault received by an institution and the number of types of resolutions. See Minnesota Statute Section 135A.15. Data collected for purposes of submitting annual reports containing those statistics to the Minnesota Office of Higher Education under Minn. Stat. 135A.15 shall only be disclosed to the victim, persons whose work assignments reasonably require access, and, at the victims request, police conducting a criminal investigation. Nothing in this paragraph is intended to conflict with or limits the authority of Dunwoody to comply with other applicable state or federal laws.

## Immediate and Ongoing Assistance following an Incident of Sexual Misconduct

Dunwoody will support any person adversely impacted by sexual misconduct. Both Dunwoody and the Minneapolis community provide a variety of resources to assist and support individuals who have

experienced sexual misconduct or are affected by allegations of sexual misconduct. These resources, both immediate and ongoing, are available to all persons irrespective of their decision to report to the College or to law enforcement. Contact information for on- and off-campus resources (including confidential resources) who can provide an immediate response in a crisis situation, including assisting with obtaining needed resources and explaining reporting options, is listed in the Resources section at the end of this policy and on the College's website. Emergency numbers and information about health care options are also listed in the Resources section at the end of this policy and on the College's website.

Support services that may be available include, but are not limited to, connecting the individual with appropriate on-campus and off-campus counseling, health, mental health, victim advocacy, legal assistance, visa and immigration assistance, student financial aid, and support services; making changes to academic, living, transportation, and/or working arrangements; assistance in filing a criminal complaint; and providing information about restraining orders and other available protections and services. Additional information about ongoing assistance is in the Interim Measures section below. To receive information about obtaining support services, individuals should contact the Title IX Coordinator or a confidential resource.

Dunwoody will provide written notification to affected individuals about existing counseling, health, mental health, victim advocacy, legal assistance, visa and immigration assistance, student financial aid, and other services available for victims, both within the College and in the community.

A complete description of Dunwoody and community resources, both confidential and non-confidential, and additional information regarding what to do if you are sexually assaulted is provided in the Resources section at the end of this policy and on the College's website. Individuals who believe they have been subjected to any form of sexual misconduct are encouraged to seek support from these resources.

## Reporting Sexual Misconduct

The College encourages anyone who has experienced or knows of sexual misconduct to report the incident to the College. Reports should include as much information as possible to enable the College to respond appropriately. An individual may report sexual misconduct to the College by contacting the following:

Carla Pogliano Connor, Ph.D.  
Title IX Coordinator  
Vice Provost for Program Development and Compliance  
612-381-8236  
Office: Silver Level  
cc Connor@dunwoody.edu (cpogliano@dunwoody.edu)

Students: Dean of Students, Kelli Sattler 612-381-3437  
Office: Pinska Center, ksattler@dunwoody.edu

Employees: Vice President of Human Resources,  
Patricia Edman 612-381-3308, Office: Blue 54  
pedman@dunwoody.edu

The College wants to respond appropriately to all incidents of sexual misconduct, but it can do so only if it is aware of them. Dunwoody, therefore, encourages all individuals to report all incidents of sexual misconduct to the College so that the College can appropriately address such incidents. Reports can be made by telephone, via email, or in

person. As discussed below, individuals also have the option to file an anonymous report using the College's anonymous online reporting form.

When a student or employee reports to the College that they have been a victim of sexual assault, dating violence, domestic violence, or stalking, whether the offense occurred on or off campus, the College will provide the student or employee with a written explanation of the student's or employee's rights and options and procedures victims should follow.

Statistics relating to reports to Dunwoody of certain criminal offenses will be represented in the annual crime statistics published by Dunwoody as required by applicable law.

## Employee Reporting Obligations

In order to enable Dunwoody to respond effectively and to prevent future instances of sexual misconduct, all Dunwoody employees who are not confidential resources, who obtain or receive information regarding a possible violation of this policy must report that information to the Title IX Coordinator. Student employees who receive such information in the course of their work position or duties also must report the information to the Title IX Coordinator. Such report should be made as soon as possible and should include all relevant details needed to assess the situation. This includes, to the extent known, the names of the accused (if known), the individual alleged to have experienced the sexual misconduct, other individuals involved in the incident, as well as relevant facts, including the date, time, and location. Employees who receive such reports should not attempt to "investigate" the allegation or require the alleged victim/reporting individual to provide all of the details surrounding the alleged misconduct. To the extent the alleged victim/reporting individual provides detail, that information should be provided to the Title IX Coordinator. Upon receiving a report of alleged or possible sexual misconduct, the Title IX Coordinator will evaluate the information received and determine what further actions should be taken consistent with the complaint resolution process and this policy.

## Mandatory Reporting Concerning Minors

Any Dunwoody employee who becomes aware of the abuse (physical or sexual) or neglect of a child under the age of 18 on campus or in connection with any Dunwoody event, program, or activity must report it immediately to Campus Security and the Title IX Coordinator. In addition, as a mandatory reporter under Minnesota law, such individual must also immediately report the abuse or neglect to the local welfare agency, agency responsible for assessing or investigating the report, police department, or county sheriff.

## Anonymous Reports

The College will accept anonymous reports of sexual misconduct.

Reports may be filed anonymously using the College's anonymous online reporting form without requesting further action from the College.

The individual making the report is encouraged to provide as much detailed information as possible to allow the College to investigate the report and respond as appropriate. The College may be limited in its ability to investigate an anonymous report unless sufficient information is furnished to enable the College to conduct a meaningful and fair investigation.

## Reporting to Law Enforcement

Some types of sexual harassment and sexual misconduct prohibited by this policy, such as sexual assault, also constitute criminal conduct.

If you are the victim of sexual assault or another crime, Dunwoody

encourages you to contact law enforcement immediately. Law enforcement can help you obtain medical treatment, can immediately begin an investigation, and can take steps to ensure that evidence is preserved so that the crime may be prosecuted. Dunwoody will, at the direction of law enforcement, provide complete and prompt assistance in obtaining, securing, and maintaining evidence in connection with criminal conduct that violates this policy.

Reporting potentially criminal conduct to Dunwoody does not require an individual to make a report to law enforcement. However, at the victim's request, Dunwoody will provide assistance in reporting criminal conduct to law enforcement and will preserve any materials relevant to a report or proceeding initiated under this policy. The College will comply with an individual's request for assistance in notifying authorities.

Additionally, a decision not to file a criminal complaint does not preclude a complainant from making a complaint under this policy. An individual can bring a complaint under Dunwoody's policy, even if the individual chooses not to report to law enforcement.

If you would like to report sexual violence to law enforcement, the Minneapolis Police Department can be contacted by calling 911 or (612) 673-5701. This phone number is a call directly to the Police Department. You will be asked the nature of your call and be connected with specific law enforcement officers who are trained to interact with sexual assault victims.

Minnesota law provides individuals who report crimes to law enforcement with certain rights. For further information, consult Crime Victim Rights, a publication of the Minnesota Department of Safety, or Minnesota Statutes Chapter 611A.

## Harassment Orders, Protective Orders, and No-Contact Orders

Individuals who would like to avoid contact with another individual have several options available to them, including seeking a harassment restraining order or protective order from a civil court or requesting a no-contact order from the College.

Harassment restraining orders and orders for protection are legal orders issued by a state court which forbid someone from harassing and/or making contact with another. A harassment restraining order is a court order issued against an alleged harasser, regardless of the relationship between the alleged harasser and the alleged victim, which orders the harasser to stop harassing the victim and/or to have no contact with the victim. An order for protection is a civil court order that protects one family or household member from domestic abuse by another family or household member. The College does not issue harassment restraining orders or orders for protection, but one can be obtained through making an application to the Hennepin County District Court. Petition forms to apply for Harassment Restraining Orders or to seek an Order for Protection are available at the Hennepin County Government Center in downtown Minneapolis, 300 S. 6th Street, Minneapolis, MN 55847. Forms are also available on-line from the Minnesota Judicial Branch website at [www.mncourts.gov](http://www.mncourts.gov), but forms must be submitted to the Court Administrator at the Hennepin County Government Center during business hours. Individuals seeking an order for protection may obtain assistance from the Hennepin Domestic Abuse Service Center at the Hennepin County Government Center, 300 S. 6th Street, Room #A-0650 (lower level), Minneapolis, MN 55847. Individuals may schedule an appointment at the Domestic Abuse Service Center by calling (612) 348-5073, or walk-in assistance is available on a limited



basis. Individuals seeking a harassment restraining order may seek assistance on a walk-in basis from the Hennepin County Court Self-Help Center at the Hennepin County Government Center, 300 S. 6th Street, 2nd Floor, PSL, Minneapolis, MN 55487.

A no-contact directive is a College-issued directive that prohibits one or both parties from communication or contact with another. No-contact directives may be mutual or one-sided. Generally, no-contact directives issued pending the outcome of an investigation will be mutual and serve as notice to both parties that they must not have verbal, electronic, written, or third party communication with one another. To request a no-contact directive from the College, individuals should contact Carla Connor, Ph.D., Title IX Coordinator and Vice Provost for Program Development and Compliance, 612-381-8236, Office: Silver Level, cconnor@dunwoody.edu.

The College is responsible for honoring requests for information about available options for orders for protection, restraining orders, and no-contact orders and has a responsibility to comply with and enforce such orders. To request additional information about available options for orders for protection, restraining orders, and no-contact orders, contact the Title IX Coordinator. An order of protection and/or harassment restraining order can be enforced by contacting local law enforcement. A College-issued no-contact directive may be enforced by contacting Dunwoody Campus Security or the Title IX Coordinator. The College will fully cooperate with any harassment restraining order and/or order for protection issued by a criminal, civil, or tribal court.

## Crime Victims Bill of Rights

Pursuant to state law, victims of crime must be informed of their rights under the Crime Victims Bill of Rights. The following is a summary of crime victims' rights under Minnesota law.

When a crime is reported to law enforcement, victims have the right to:

- Request that their identity be kept private in reports available to the public;
- Be notified of crime victim rights and information on the nearest crime victim assistance program or resource;
- Apply for financial assistance for non-property losses related to a crime;
- Participate in prosecution of the case, including the right to be informed of a prosecutor's decision to decline prosecution or dismiss their case;
- Protection from harm, including information about seeking a protective or harassment order at no cost;
- Protection against employer retaliation for taking time off to attend protection or harassment restraining order proceedings; and
- Assistance from the Crime Victims Reparations Board and the Commissioner of Public Safety.

Victims of domestic abuse also have the right to terminate a lease without penalty. Victims of sexual assault have the right to undergo a confidential sexual assault examination at no cost, make a confidential request for HIV testing of a convicted felon, and are not required to undergo a polygraph examination in order for an investigation or prosecution to proceed. In cases of domestic abuse and violent crime where an arrest has been made, victims also have the right to be provided notice of the release of the offender, including information on the release conditions and supervising agency.

Complete information about crime victims' rights can be found at: [dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/crime-victims-rights.aspx](http://dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/crime-victims-rights.aspx) (<http://dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/crime-victims-rights.aspx>).

Information about victims' rights is also available from the Title IX Coordinator or from the Minnesota Department of Public Safety, Office of Justice Programs, and in Minnesota Statutes Chapter 611A.

## Retaliation Prohibited

Retaliation against any individual for making a complaint under this policy, for opposing harassment, or for participating in an investigation of any claim regarding harassment or sexual misconduct is strictly prohibited. Dunwoody will not tolerate any form of retaliation, either on campus or off campus, against any individual who makes a good faith report or complaint of a potential policy violation, supports another person's report or complaint, responds in good faith to a complaint, participates in good faith in the investigation of a complaint or the complaint resolution process, or opposes in good faith a practice or conduct that the person reasonably believes is in violation of this policy.

Encouraging or assisting others to engage in retaliation also violates this Policy. If you feel you have experienced such retaliation, you should **immediately** contact:

Carla Pogliano Connor, Ph.D.  
Title IX Coordinator  
Vice Provost for Program Development and Compliance  
612-381-8236  
Office: Silver Level  
cconnor@dunwoody.edu (cpogliano@dunwoody.edu)

The following individuals may also be contacted:

Students: Dean of Students, Kelli Sattler 612-381-3437  
Office: Pinsky Center, ksattler@dunwoody.edu

Employees: Vice President of Human Resources, Patricia Edman  
612-381-3308, Office: Blue 54  
pedman@dunwoody.edu

As described in the Complaints of Retaliation, Violation of Interim Measures, and Violation of Sanctions section below, Dunwoody will take appropriate action against any individual who retaliates against another person in violation of this policy. Retaliation is defined in the Definitions section of this policy.

## Waiver of Drug/Alcohol Violations

Dunwoody strongly encourages reporting instances of sexual misconduct, including sexual assault, dating violence, domestic violence, and stalking. Consequently, individuals who make a good faith report of such information, and individuals who participate in an investigation into allegations of violations of this policy, will not be disciplined by Dunwoody for any violation of its drug and alcohol policies in which they might have engaged in connection with the reported incident. Dunwoody, however, reserves the right to require individuals to participate in training or educational programming designed to reduce risk and promote health and wellbeing. The participation in such training or educational programming will not be reflected on a community member's official records.

## General Provisions for Complaint Resolution Process

When Dunwoody receives a complaint of a potential policy violation, Dunwoody will promptly investigate and address the complaint pursuant to the guidelines and procedures set forth below.

## Rights of the Complainant and Respondent

The complainant and respondent are entitled to:

- Be treated with respect, sensitivity, and dignity;
- Appropriate support from the College;
- Privacy to the extent possible based on applicable law and College policy;
- Information on the policy and procedures;
- The right to participate or decline to participate in the complaint resolution process, with the acknowledgement that not participating, either totally or in part, may not prevent the process from proceeding with the information available;
- Equitable procedures that provide both parties with a prompt, fair and impartial investigation and resolution conducted by officials who receive annual training on conduct prohibited by the policy;
- Notice of the allegations and defenses and an opportunity to respond;
- An equal opportunity to identify relevant witnesses and other evidence and to suggest possible topics to be covered with witnesses during the formal process;
- For the complainant, not to be questioned or have evidence considered regarding the complainant's prior sexual conduct with anyone other than the respondent;
- For the complainant, not to be treated in a manner that suggests she or he is at fault for the sexual assault or violence or that she or he should have acted in a different manner to avoid becoming a victim;
- The right to appeal the decision and/or the sanctions;
- The right to notification, in writing, of the resolution, including the outcome of any appeal;
- The right to report the incident to law enforcement at any time or to decline to do so.

## Additional Rights in Cases Involving Allegations of Sexual Assault, Dating Violence, Domestic Violence, or Stalking

In cases involving allegations of sexual assault, dating violence, domestic violence, or stalking, the following rights will be afforded to the complainant and the respondent in addition to those rights described above.

- The complainant and respondent will be provided timely notice of meetings at which the complainant or respondent may be present.
- The complainant and respondent will be provided timely and equal access to any information that will be used during informal and formal disciplinary meetings during the adjudication phase of the complaint resolution process.
- The complainant and respondent have the right to the complete and prompt assistance of campus authorities, at the direction of law enforcement authorities, in obtaining, securing, and maintaining evidence in connection with a sexual assault incident.

- The complainant and respondent have the right to the assistance of campus authorities in preserving materials relevant to a campus complaint proceeding.
- The complainant and respondent have the right to have an advisor present during the complaint resolution process. The College will not limit the choice of advisor or presence of the advisor for the complainant or respondent in any meeting or disciplinary process. See the Advisors section below for additional information and rules regarding the conduct of advisors.
- The complainant and respondent have the right to the assistance of campus personnel (during and after the complaint process), in cooperation with the appropriate law enforcement authorities, in shielding the complainant or respondent, at their request, from unwanted contact with the complainant or respondent, including but not limited to transfer to alternative classes or to alternative college-owned housing, if alternative classes or housing are available and feasible.
- The complainant and the respondent have the right to be provided access to their own description of the incident, as they reported it to Dunwoody, including if the individual transfers to another post-secondary institution, subject to compliance with FERPA, the Clery Act, Title IX, and other federal or state law. Requests for an individual's description of the incident should be made to the Title IX Coordinator.
- The complainant has the right to decide when to repeat a description of an incident of sexual assault, dating violence, domestic violence, or stalking and the respondent has the right to decide when to repeat a description of a defense to such allegations.

In addition, a complainant who alleges sexual assault, dating violence, domestic violence, or stalking has the following rights:

- To be informed by the College of options to notify proper law enforcement authorities, including on campus and local police, of a sexual assault, dating violence, domestic violence, or stalking incident, or to decline to notify such authorities;
- To the complete and prompt assistance of campus authorities, at the complainant's request, in notifying law enforcement officials and College officials of a sexual assault, dating violence, domestic violence, or stalking incident and filing criminal charges with local law enforcement officials in sexual assault, dating violence, domestic violence, and stalking cases.
- To be offered fair and respectful health care, counseling services, or referrals to such services and notice of the availability of campus or local programs providing sexual assault, dating violence, domestic violence, or stalking advocacy services;
- To be offered assistance from the Crime Victim Reparations Board and the Commissioner of Public Safety.
- For students who choose to transfer to another post-secondary institution, the right to receive information about resources for victims of sexual assault, dating violence, domestic violence, or stalking at the institution to which the victim is transferring

## Advisors in Cases Involving Allegations of Sexual Assault, Dating Violence, Domestic Violence, or Stalking

The complainant and the respondent in the complaint resolution process involving allegations of sexual assault, dating violence, domestic violence,

and stalking have the right to be assisted by an advisor of their choice, including an attorney. Generally, the advisor selected by the complainant or respondent should be free of conflicts of interest in the resolution process and, if a member of the Dunwoody community, the advisor should be free of conflicts in his or her position in the community. An individual has the right to decline a request to serve as an advisor in Dunwoody's complaint resolution process.

Guidelines for advisors are:

- The purpose of the advisor is to support an individual during the complaint resolution process. An advisor is permitted to accompany the individual to in-person interviews or other meetings during the complaint resolution process. In selecting an advisor, each party should consider the potential advisor's availability to attend in-person interviews and meetings. As a general matter, the College will not unnecessarily delay its proceedings to accommodate the schedules of advisors.
- Advisors may confer with their advisee, but they may not actively participate in the complaint resolution process. The advisor may accompany the complainant or respondent to all meetings relating to the complaint resolution process. The advisor may not appear in lieu of the complainant or respondent or speak on their behalf in either in-person or written communications to the College. The advisor may not communicate directly with the investigator, adjudicators, appeal officers, Title IX Coordinator or any other school official involved in the complaint resolution process and may not interrupt or otherwise delay the complaint resolution process.
- Advisors may have access to information concerning a case only when accompanying the party (for in-person access to information) or only when the party has given permission for the advisor to be copied on emails or other correspondence (for access to written communications). An advisor's access to such information is subject to the same limitations as those placed upon the parties and conditioned upon the advisor's agreement to maintain the confidentiality of any student education records or other confidential information.
- If a party selects an attorney as an advisor, the advisor's participation in the complaint process is in the role of an advisor and not as an attorney representing a party. The advisor will have access to highly confidential information and is prohibited from sharing information obtained as an advisor during the complaint process with anyone, including other individuals who may be part of an attorney-client relationship with the party.
- The College will notify a party to a complaint resolution process if another party involved in the complaint resolution process has obtained an advisor. The notice shall indicate if the other party's advisor is an attorney.
- Advisors will be required to sign an Advisor Agreement acknowledging receipt and understanding of these requirements. Failure to comply with these requirements, including violations of confidentiality, or other forms of interference with the complaint resolution process by the advisor may result in disqualification of an advisor. The College reserves the right to dismiss an advisor.

## Requests for Reasonable Accommodations

Individuals who need a reasonable accommodation should contact the Title IX Coordinator. The College will consider requests for reasonable

accommodations submitted to the Title IX Coordinator on a case-by-case basis. Accommodations the College may provide include:

- Providing reasonable accommodations as required by law to an individual with a disability who requests an accommodation necessary to participate in the complaint resolution process.
- Providing an interpreter for individuals who are limited English-language proficient.

## Protective and Interim Measures

The College will provide written notification to victims about options for, available assistance in, and how to request changes to academic, living, transportation, and working situations or protective measures. The College is obligated to comply with a student's reasonable request for a living and/or academic situation change following an alleged sex offense. At any time after a report of a potential violation of this policy has been received by the College, the Title IX Coordinator or designee(s) will consider whether interim actions, accommodations, or protective measures are reasonably necessary or appropriate to protect the parties and the broader Dunwoody community, pending completion of the complaint resolution process. The College will make accommodations and provide protective measures for an individual who believes he or she has experienced sexual misconduct, if requested and reasonably available. The College must make such accommodations and provide such protective measures even when an individual asks to keep a reported violation of this policy confidential, when a request is made to not investigate the matter, and regardless of whether an individual chooses to report to law enforcement. When appropriate, such interim actions, accommodations, and protective measures may be available to the complainant, respondent, and others adversely impacted by the complaint resolution process, if requested and reasonably available.

Examples of interim actions, accommodations, and protective measures include, without limitation:

- Establishing a "no contact" directive prohibiting the parties involved from communicating with each other during the response and resolution process.
- Changing an individual's dining arrangements.
- Assistance in finding alternative housing.
- Special parking arrangements.
- Changing an individual's student or employee status or job responsibilities.
- Changing an individual's work or class schedule.
- Providing academic accommodations or providing assistance with academic issues.
- Providing security escorts.
- Providing a temporary cellphone.
- Access to counseling and medical services.
- Making information about orders for protection and harassment restraining orders available to a complainant.
- Assistance identifying an advocate to help secure additional resources or assistance, including off-campus and community advocacy, support, and services.
- For students who choose to transfer to another institution: At the student's request, providing information about resources for victims of sexual assault at the institution to which the student is transferring.

The College determines which measures are appropriate for a particular individual on a case-by-case basis. Such measures will vary based on the particular facts and circumstances, including but not limited to the specific need expressed by the complainant, the age of the student[s] involved, the severity or pervasiveness of the allegations, any continuing effects on the complainant, whether the complainant and alleged respondent share the same dining hall, class, transportation, or job location, and whether other judicial measures have been taken to protect the complainant. The Title IX Coordinator will be responsible for determining what measures will be put in place.

To request an accommodation or interim measure, individuals should contact the Title IX Coordinator.

The College will maintain as confidential any interim measures or protective measures provided to an individual, to the extent that maintaining such confidentiality would not impair the ability of the College to provide the accommodations or protective measures.

The College will only disclose information necessary to provide the accommodations or protective measures in a timely manner to individuals who need to know the information in order to effectively provide the accommodations or protective measures. The Title IX Coordinator will determine what information about a victim should be disclosed and to whom this information will be disclosed based on the facts and circumstances of the specific situation and the accommodation to be provided. The College will inform the victim before sharing personally identifying information that the College believes is necessary to provide an accommodation or protective measure. The College will tell the victim which information will be shared, with whom it will be shared, and why it will be shared.

Additional services are available on campus and/or in the community, as described in the Resources section at the end of this policy and on the College's website.

Any concern about a violation of an interim measure should be reported to the Title IX Coordinator promptly.

## Obligation to Act in Good Faith

Reports and complaints of alleged sexual misconduct should be made only in good faith. Complaints that are not made in good faith may be a form of retaliation under this policy and/or may violate other Dunwoody policies. All parties and witnesses have an obligation to be truthful in the process.

## Conflicts

If a complainant or respondent has any concern that any individual acting for the College under this policy has a conflict of interest or bias, such concern should be reported in writing to the Title IX Coordinator. Any concern regarding a conflict of interest or bias must be submitted in writing within two (2) calendar days after receiving notice of the person's involvement in the process. The Title IX Coordinator will review the concerns and take appropriate steps to ensure that no conflicts of interest exist on the part of anyone investigating or resolving a complaint under this policy.

If the Title IX Coordinator has a conflict of interest with respect to a complaint, the College's Vice President of Human Resources shall appoint an alternate person to oversee adherence to the Sexual Misconduct Policy with respect to the complaint at issue. If the Title IX Coordinator and Vice President of Human Resources have a conflict of interest with respect to a complaint, the Dean of Students shall ensure that the College puts in place appropriate safeguards under the circumstances to ensure that the institution promptly and equitably

responds to the complaint, including, but not limited to, appointment of alternate individuals to oversee adherence to the Sexual Misconduct Policy.

## Non-Participation and Silence

Either party may decline, at any time, to provide information or participate further in the complaint resolution process. If, at any time during the complaint resolution process, a party decides not to participate, the College will proceed with the complaint resolution process and make a determination based upon the information available. Even if a party decides not to participate or chooses to stop participating at a phase of the process, the party will still be given the option to participate during additional phases of the process. A respondent's silence in response to a complainant's allegation will not necessarily be viewed as an admission of the allegation, but may leave the complainant's allegations undisputed.

Similarly, a complainant's silence in response to a respondent's denials or defenses will not necessarily be viewed as an admission of the denials or defenses, but may leave the respondent's denials or defenses undisputed.

## Time Frames for Resolution

Dunwoody is committed to the prompt and equitable resolution of allegations of sexual misconduct. Dunwoody will strive to conclude the response and resolution process within 75 days of receiving a complaint alleging a policy violation. Specific time frames for each phase of the complaint resolution process are set forth in the Procedures for Sexual Misconduct Complaint Resolution below.

Each phase of the process will generally be as follows:

- Review of report or complaint and Notice of complaint to the respondent—nine (9) calendar days
- Investigation—thirty-five (35) calendar days
- Response and Rebuttal—ten (10) calendar days
- Adjudication—twenty-one (21) calendar days

Circumstances may arise that require the extension of time frames based on the complexity of the allegations, the number of witnesses involved, the availability of the parties involved, witnesses being absent from campus, the effect of a concurrent criminal investigation, unsuccessful attempts at informal resolution, any intervening school break, vacation, or other unforeseen circumstance.

In cases where conduct that violates this policy has also been reported to the police, Dunwoody will not delay its investigation and resolution procedures in order to wait for the conclusion of a criminal investigation or proceeding. The College will, however, comply with valid requests by law enforcement for cooperation in a criminal investigation. As such, the College may need to delay temporarily an investigation under this policy while law enforcement is in the process of gathering evidence. This process typically takes 7-10 days. Once law enforcement has completed its gathering of evidence, the College will promptly resume and complete its investigation and resolution procedures.

In the event that the investigation and resolution exceed the 75-day timeframe, or to the extent additional time is needed during any of the phases of the process discussed above or below, the College will notify all parties of the reason for the delay and the expected adjustment in time frames. When a time frame for a specific phase of the process, as set forth below, is less than five (5) calendar days, Dunwoody may, in its discretion, use business days to calculate the time frame deadline.

Efforts will be made to complete the process in a timely manner



balancing principles of thoroughness, fundamental fairness, and promptness.

Complainants are encouraged to begin the complaint resolution process as soon as possible following an alleged incident. There is no statute of limitation for reporting prohibited conduct to the College under this policy; however, the College's ability to respond may diminish over time, as evidence may erode, memories may fade, and respondents may no longer be affiliated with the College. If a complaint is brought forward more than three (3) calendar years after an alleged incident, the College, in its discretion, may decline to process a complaint under these procedures, but reserves the right to take other administrative action as appropriate depending on the specific circumstances of the complaint, and will provide reasonably appropriate remedial measures, assist the complainant in identifying external reporting options, and take reasonable steps to eliminate prohibited conduct, prevent its recurrence, and remedy its effects. If at least one party involved in the complaint is still a member of the College community as a student or employee, the complaint generally will be processed under these procedures.

## Application of Policy

When the College receives a report or complaint of a violation of this Policy, the College will apply the complaint resolution procedures from the Policy that is in effect at the time that the report or complaint is made and generally will apply the sexual misconduct definitions from the policy that was in effect at the time the alleged misconduct occurred.

## Reservation of Flexibility

The procedures set forth in this policy reflect the College's desire to respond to complaints in good faith and in a manner that promotes fairness to all parties. The College recognizes that each case is unique and that circumstances may arise which require that it reserve some flexibility in responding to the particular circumstances of the matter.

Where it is not possible or practical to follow these procedures, the College reserves the right to modify the procedures or to take other administrative action as appropriate under the circumstances.

In instances where a complaint is made against an individual who is not a student or employee of the College, the College reserves discretion to use a process or procedures other than those outlined below, as appropriate under the circumstances.

## Procedures for Sexual Misconduct Complaint Resolution

All processes involving a sexual misconduct complaint will provide a prompt, fair, and impartial investigation and resolution. Processes will be conducted by individuals who do not have a conflict of interest or bias for or against the complainant or respondent and who receive annual training on the issues related to sexual harassment, sexual assault, domestic violence, dating violence, stalking, and how to conduct an investigation and decision-making process that protects the safety of all and promotes accountability. The training is free of bias such as sex stereotypes or generalizations and includes the following topics: relevant evidence and how it should be used, proper techniques for questioning witnesses, basic rules for conducting proceedings, avoiding actual or perceived conflicts of interest, preventing sexual assault, responding to incidents of sexual assault, the dynamics of sexual assault, neurobiological responses to trauma, and compliance with state and federal laws on sexual assault. In addition, processes will be conducted

by individuals who do not have a conflict of interest or bias for or against the complainant or respondent.

## Sexual Misconduct Complaint

The filing of a complaint begins the complaint resolution process under this procedure. In most cases, complaints are made by the complainant. However, the College reserves the right to move forward with the complaint resolution process to protect the safety and welfare of the community, even if an individual chooses not to make or move forward with a complaint. Generally, the Title IX Coordinator will make a determination of whether the College will move forward with a complaint resolution process in the absence of a filed complaint. If the College decides that it has an obligation to move forward with the complaint resolution process, it will notify the alleged victim before proceeding.

Complaints of sexual misconduct should be made through the Title IX Coordinator or the following designees:

Carla Connor, Ph.D.  
Title IX Coordinator  
Vice Provost for Program Development and Compliance  
612-381-8236 cconnor@dunwoody.edu (cpogliano@dunwoody.edu)  
Office: Silver Level

**Students:**  
Kelli Sattler  
Dean of Students  
612-381-3437  
Office: Pinska Level  
ksattler@dunwoody.edu (kellisattler@dunwoody.edu)

**Employees:**  
Patricia Edman  
Vice President of Human Resources  
612-381-3308  
Office: Blue 54  
pedman@dunwoody.edu

## Initial Title IX Review and Assessment and Notice to Respondent

In most cases, the first step of the complaint resolution process is a preliminary meeting between the complainant and the Title IX Coordinator or the Title IX Coordinator's designee(s). The purpose of the preliminary meeting is to allow the Title IX Coordinator to gain a basic understanding of the nature and circumstances of the report or complaint; it is not intended to be a full investigation interview.

As part of the initial meeting with the complainant, the Title IX Coordinator or the Title IX Coordinator's designee(s) will:

- assess the nature and circumstances of the allegation;
- address immediate physical safety and emotional well-being of the complainant;
- notify the complainant of the right to contact law enforcement and seek medical treatment;
- notify the complainant of the importance of preservation of evidence;
- provide the complainant with information about on- and off-campus resources;
- notify the complainant of the range of interim accommodations and remedies;

- provide the complainant with an explanation of the procedural options, including how to file a complaint and the complaint process;
- in cases involving allegations of sexual assault, dating violence, domestic violence, or stalking, advise the complainant of the right to have an advisor of choice;
- discuss the complainant's expressed preference for the manner of resolution and any barriers to process; and
- explain the College's policy prohibiting retaliation.

All reports and complaints of sexual misconduct will be reviewed by the Title IX Coordinator and/or the Title IX Coordinator's designee(s) to determine the risk of harm to individuals or to the campus community. Steps will be taken to address these risks in consultation with the members of the Title IX Team. The Title IX Coordinator and/or the Title IX Coordinator's designee(s) will also assess the reported conduct for the need for a timely warning under the Clery Act; and assess for pattern evidence or other similar conduct by respondent.

The Title IX Coordinator or designee(s) has discretion to refer the matter to other College disciplinary procedures. This referral option will generally be used when the alleged behavior does not fall within the policy or the alleged behavior applies to another disciplinary procedure. If the Title IX Coordinator or designee(s) determines that the report or complaint, even if substantiated, would not be a violation of this policy, they may dismiss the matter or refer it to another applicable disciplinary procedure. The parties will be notified of that determination and the complainant will be informed of other procedures for resolving the complaint and of other resources that may be available to the complainant.

When the Title IX Coordinator has received a complaint of sexual misconduct, the Title IX Coordinator or designee(s) will meet with the respondent and will:

- notify the respondent of the complaint and alleged policy violation that is being investigated;
- provide the respondent an explanation of the complaint process;
- notify the respondent of the importance of preservation of evidence;
- notify the respondent of any interim accommodations or protective measures that have been put in place that directly relate to the respondent (i.e., no-contact order);
- notify the respondent of any available interim accommodations and protective measures;
- provide the respondent with information about on- and off-campus resources;
- in cases involving allegations of sexual assault, dating violence, domestic violence, or stalking, advise the respondent of the right to have an advisor of choice; and
- explain the College's policy prohibiting retaliation.

This stage of initial review of the report or complaint by the Title IX Coordinator and initial notice of complaint to the respondent generally will take no more than nine (9) calendar days.

## Investigation of Other College Policy Violations

If a complaint of sexual misconduct also implicates alleged violations of other Dunwoody policies, the Title IX Coordinator or the Title IX Coordinator's designee(s), in coordination with other appropriate school officials, will evaluate the allegations to determine whether the investigation of the alleged sexual misconduct and the other alleged

policy violations may be appropriately investigated together without unduly delaying the resolution of the sexual misconduct complaint. Where the Title IX Coordinator or the Title IX Coordinator's designee(s), in coordination with other appropriate school officials, determines that a single investigation is appropriate, the determination of responsibility for each of the alleged policy violations will be evaluated under the applicable policy, but the investigation and adjudication will be conducted in accordance with this Policy.

## Voluntary Resolution Process

When the complainant chooses to move forward with the complaint resolution process, the complainant has the option to proceed informally, where permissible. In cases involving complaints against students where material facts are not in dispute and the alleged misconduct does not constitute a significant policy violation (for example, a single inappropriate comment), the Dean of Students may, at his or her discretion, determine an appropriate fair and equitable resolution without involvement of the Provost and notify the parties and the Provost of the outcome. In cases involving complaints against faculty or non-student Dunwoody employees where material facts are not in dispute and the alleged misconduct does not constitute a significant policy violation, the Vice President of Human Resources may determine an appropriate fair and equitable resolution and notify the parties of the outcome. The voluntary resolution process will generally not be allowed in cases of sexual assault, domestic violence, dating violence, or stalking.

The College will not compel a complainant or respondent to engage in mediation, to directly confront the other party, or to participate in any particular form of informal resolution. In cases involving allegations of sexual assault or more serious sexual misconduct, informal resolution may not be appropriate.

In cases where the voluntary resolution process is used, either party may request to end the voluntary process (and return to the formal resolution process below) at any time before completion. The Title IX Coordinator may also choose to end the voluntary process prior to completion.

Any informal resolution must adequately address the concerns of the complainant, as well as the rights of the respondent and the overall intent of the University to stop, remedy, and prevent policy violations. In its effort to stop, remedy, and prevent policy violations, the College will take prompt and corrective action through the imposition of individual and community remedies designed to maximize the complainant's access to the educational and extracurricular activities of the College. Examples of potential remedies are provided in the Protective and Interim Measures section of the policy. The recommended resolution may also include other institutional responses or requirements imposed on the respondent.

The voluntary resolution process ends when a resolution has been reached or when the complainant, the respondent, or the College terminates the process. If the parties to the complaint agree in writing to the terms and conditions of a recommended resolution within five (5) calendar days of the Title IX Coordinator or the Title IX Coordinator's designee presenting the recommended resolution to the parties, the case will be resolved without further process under this procedure. If all parties to the complaint do not agree in writing to the terms and conditions of the recommended resolution within five (5) calendar days of the Title IX Coordinator or the Title IX Coordinator's designee presenting the recommended resolution to the parties, the complaint will be referred to the formal resolution process. If the complaint is referred to the formal resolution process, the time spent attempting to reach an informal resolution generally will not be counted as part of the seventy-five (75)-

day time frame discussed in the “Time Frames for Resolution” section above.

Appeals are not allowed in cases where the parties have agreed to a voluntary alternative resolution of the matter.

## Formal Resolution Process

If the complaint is not processed or resolved through the voluntary resolution process discussed above, the complaint will be processed according to the formal resolution process outlined below.

## Investigation

Dunwoody will appoint one or more trained and impartial investigators to conduct a prompt, equitable, thorough, fair, and appropriate investigation. In most cases, the investigation will be conducted by the Dean of Students, but Dunwoody may, in its discretion, appoint an alternative trained investigator. The parties will receive written notice of the investigator appointed. If a party has a concern that the investigator has a conflict of interest, the party should report the concern in writing as set forth in the Conflicts section above. The investigator(s) will conduct the investigation in a manner appropriate to the circumstances of the case. The investigation will typically involve interviews of the complainant and respondent and may also involve questioning of other witnesses and/or review of other information. The investigator, in his or her discretion, may decline to interview witnesses suggested by the parties and may interview witnesses who were not suggested by either party. Character or reputation evidence is generally considered to be irrelevant and will not be included as part of the investigation. If a party suggests witnesses solely for the purpose of providing general character or reputation evidence, the investigator may choose not to interview witnesses and/or to not include information related to a party's general character/reputation in the investigation report. The complainant and respondent will be given equitable opportunities to present information, including evidence and witnesses they believe should be interviewed, as part of the investigation.

The parties may decide when (or when not) to repeat a description of the alleged misconduct and have the right to decline to participate in the complaint resolution process. If at any time the complainant declines to participate in the process, the College's ability to meaningfully investigate and resolve a complaint may be limited. In such cases, the College will proceed with the complaint resolution process, if possible to do so without the complainant's participation, and will make a determination based upon the information available as set forth above in the section entitled, Non-Participation and Silence. The respondent also has the right to decline to participate in the complaint resolution process. In such cases, the College will proceed with the complaint process and will make a determination based upon the information available as set forth in the above section entitled, Non-Participation and Silence.

The parties will be informed of a close of evidence date. The parties must submit any and all information and evidence believed to be relevant to the complaint by the close of evidence date. After the close of evidence date, the parties will not be permitted to submit new or additional evidence that existed prior to the close of evidence date, unless the investigator determines otherwise.

At the conclusion of the investigation, the investigator(s) may prepare a report setting forth the facts gathered. The investigator(s) generally will compile an investigation file, which may consist of any information, documents, recordings, or other evidence that are provided to the adjudicators. Such information may include, as applicable: the

written complaint, recordings or written records of interviews with the complainant, respondent, and any witnesses, any other evidence obtained during the investigation, and the investigator's report of the investigation. The investigation file shall be forwarded to the Title IX Coordinator. The Title IX Coordinator or designee(s) will review the investigation file and has the discretion to ask the investigator(s) for clarification, additional investigation, and/or to have information removed or redacted from the investigation report.

The College will strive to complete the investigation within thirty-five (35) calendar days from the date of the complaint, but this time frame may be extended depending on the circumstances of each case, including the complexity of the allegations, the number of witnesses involved, the availability of the parties or witnesses involved, the effect of a concurrent criminal investigation, unsuccessful attempts at informal resolution, any intervening school break, vacation, or other unforeseen circumstance.

For complaints involving allegations of sexual assault, dating violence, domestic violence or stalking, the investigation file will be made available for review by the complainant and respondent. The Title IX Coordinator will provide a seven (7) calendar day period for the complainant and respondent to have access to review the investigation file and prepare a response to the investigation filed, as discussed below. The parties' review of the investigation file generally will be provided during normal business hours in a designated on-campus location. The investigation file cannot be removed from that location, nor can copies be made or pictures taken of the file contents.

Both parties will have the opportunity to provide a written response to the report. To do so, the party must submit an Initial Written Statement, which shall not exceed 2,000 words in length, to the Title IX Coordinator.

The Initial Written Statement must be submitted within seven (7) calendar days after the investigation file becomes available to the complainant and respondent (i.e., at the conclusion of the seven-day review period). The Initial Written Statement may be used as an opportunity to clarify points in the investigation report or identify information previously given to the investigator that is not included in the investigation report which the party believes should have been included. While the parties may be assisted by their advisors in preparation of the Initial Written Statement, the Initial Written Statement must be submitted by the party, must be the party's own statement, and may not be used to submit the statements of others on the party's behalf.

The parties shall have an opportunity to review the Initial Written Statement submitted by the other party and, if desired, may submit a Rebuttal Written Statement not to exceed 1,500 words. The Title IX Coordinator or the Title IX Coordinator's designee(s) will provide a three (3) business day period for the complainant and respondent to have access to review the other party's Initial Written Statement and submit a Rebuttal Written Statement. The parties' access to the Initial Written Statement generally will be provided during normal business hours in a designated on-campus location. The Initial Written Statement cannot be removed from that location, nor can copies be made or pictures taken of the contents. The Rebuttal Written Statement may only be used to respond to arguments made in the other party's Initial Written Statement. While the parties may be assisted by their advisors in preparation of the Rebuttal Written Statement, the Rebuttal Written Statement must be submitted by the party, must be the party's own statement, and may not be used to submit the statements of others on the party's behalf.

The parties shall have an opportunity to review the Rebuttal Written Statement submitted by the other party. The Title IX Coordinator or the Title IX Coordinator's designee(s) will provide a three (3) business day

period for the complainant and respondent to have access to review the other party's Rebuttal Written Statement. The parties' access to the Rebuttal Written Statement generally will be provided during normal business hours in a designated on-campus location. The Rebuttal Written Statement cannot be removed from that location, nor can copies be made or pictures taken of the contents.

The Title IX Coordinator shall review the Initial Written Statements and Rebuttal Written Statements. Based on the statements, the Title IX Coordinator has the discretion to ask the investigator(s) for clarification, additional investigation, and/or to have information removed or redacted from the investigation report. In addition, the Title IX Coordinator or designee(s) may remove or redact any portions of the parties' written statements that exceed the permitted scope of the statements as set forth above or that otherwise exceed the scope of information that may be considered in the complaint resolution process (e.g., general character or reputation evidence and evidence relating to the complainant's prior sexual history).

## Adjudication

Upon completion of the investigation, the adjudicator(s) of the case will review the investigation file and report, along with the Initial Written Statements and Rebuttal Written Statements of the parties.

- In cases where the complaint is made against a student, the Provost will be the adjudicator of the case.
- In cases where the complaint is made against a non-student employee, the Vice President of Human Resources and any other appropriate member of College leadership ("responsible individual") will be the adjudicators of the case.
- If a complaint is made against the President of the College, the chair of the Board of Trustees or other designated member of the Board shall serve as the responsible individual.
- In cases where the complaint is made against a party who is not a student and not an employee, the Title IX Coordinator will make a determination regarding the appropriate adjudicator at that time.

The adjudicator(s) will review the investigation file, along with the initial written statements and rebuttal written statements of the parties. The adjudicator(s) may, in their discretion, seek additional information from the investigator(s), the parties, or another individual, or request additional investigation by the investigator(s). If the adjudicators seek and are provided additional information, the parties will be notified and provided access to that additional information.

The adjudicator(s) will use a preponderance of the evidence standard to determine whether it is more likely than not that the respondent violated the policy and impose remedies and/or sanctions as necessary to end the misconduct, prevent its recurrence, and address its effects. The respondent is presumed to be not responsible for violating this Policy.

The respondent will be deemed responsible for a policy violation only if the adjudicator(s) conclude that there is sufficient evidence, by a preponderance of the evidence, to support a finding that the respondent engaged in sexual misconduct. If the adjudicator(s) determine that the respondent is responsible for a policy violation, they will then determine what sanctions and remedies are warranted.

If the adjudicators determine that the respondent is responsible for a policy violation, they may, in their discretion, request information from the Title IX Coordinator regarding any previous violations of this policy by

the respondent. If such information is shared with the adjudicators, the parties will be notified.

When a respondent is found not responsible for a Policy violation, but nevertheless is found to have engaged in inappropriate conduct—for example, inappropriate remarks that do not rise to the level of hostile environment sexual harassment—the College may, in its discretion, require the respondent to receive appropriate education and/or training.

The College may also recommend counseling or other support services for the respondent.

The sanctions issued will depend on the circumstances of the case, including, but not limited to the severity of the misconduct. A complete list of possible sanctions is included in the following section.

The adjudicator(s) shall make and issue a written decision within approximately twenty-one (21) calendar days following the receipt of the investigation file, the investigator's written report, and the Initial Written Statements and Rebuttal Written Statements of the parties.

## Sanctions and Remedies

The adjudicator(s) will impose remedies and/or sanctions as necessary to end the misconduct, prevent its recurrence, and address its effects.

The College reserves the right to take whatever measures deemed necessary in response to an allegation of sexual misconduct in order to protect the rights and personal safety of the complainant and Dunwoody community members. Individuals who are found responsible under this policy may face the following sanctions as appropriate for students, employees, visitors, or others. Each of these sanctions may be imposed alone or in combination for a respondent found responsible for sexual misconduct, including for violations of the sexual assault, dating violence, domestic violence, or stalking provisions of this policy:

- verbal warning
- written warning
- probation
- suspension ranging from 1 semester to 5 with reinstatement requirements that could include behavioral contracts, required attendance at educational programs, required assessment or counseling, and other potential conditions on reinstatement;
- expulsion;
- withholding of diploma or degree for a defined period of time or until the completion of assigned sanctions;
- revocation of admission to Dunwoody;
- temporary or permanent restricted access to areas of campus, and campus events, activities, organizations or courses;
- temporary or permanent removal from class or living or housing assignment;
- conditions upon presence on campus or at College events;
- no trespass or no contact orders;
- required attendance at an educational training or meetings;
- writing a reflection paper;
- behavioral contracts;
- required assessment or counseling;
- community service hours;
- loss of salary or benefit such as travel funding
- suspension of promotion and salary increments ranging from 1 semester to 5 years, with reinstatement requirements that could include behavioral contracts, required attendance at educational



programs, required assessment or counseling, and other potential conditions on reinstatement;

- removal or non-renewal of scholarships or honors;
- transfer or change of job or responsibilities;
- demotion;
- termination of employment;
- payment of restitution or costs incurred.

When an investigation reveals that a campus organization (such as a student club, athletic team, campus academic department, staff/faculty committee) has committed or promoted behavior involving sexual misconduct, the organization may be sanctioned. Sanctions to the organization may include, but are not limited to, loss of College privileges (including, but not limited to, prohibition on the organization's participation in certain activities and the use of College facilities), educational requirements for organization members, required additional oversight of organization activities, temporary loss of organization recognition and/or funding, and permanent loss of organization recognition, in addition to individual members of the organization who are determined responsible for a policy violation being subject to the sanctions listed above. All campus organizations/departments are responsible for the actions of its members when they are operating on behalf of the organization/department.

Remedies, accommodations, and protective measures for the complainant include implementing or extending remedial or protective measures, including, without limitation, the following examples:

- A mutual or one-sided no-contact order.
- Prohibiting an individual involved from being on Dunwoody property.
- Prohibiting an individual involved from participating in Dunwoody-sponsored events.
- Changing an individual's living or housing, or dining arrangements.
- Special parking arrangements.
- Changing an individual's student or employee status or job responsibilities.
- Changing an individual's work or class schedule.
- Providing academic accommodations or providing assistance with academic issues.
- Providing security escorts.
- Providing a temporary cell phone.
- Access to counseling.
- Making information about orders for protection and harassment restraining orders available to a complainant.
- Assistance identifying an advocate to help secure additional resources or assistance, including off-campus and community advocacy, support, and services.

Remedies designed to address the Dunwoody community include increased monitoring, supervision, and/or security at locations or in connection with activities where the prohibited conduct occurred or is likely to reoccur and targeted or broad-based educational programming or training for relevant persons or groups.

Any concern about a violation of an imposed sanction should be reported to the Title IX Coordinator promptly.

## Notice of Outcome

The complainant and respondent will receive a written notice of the outcome, by letter or email. The notifications will be sent to the complainant and the respondent at the same time.

For complaints involving sexual assault, dating/intimate partner violence, domestic violence, or stalking, the written notice shall include the determination of the adjudicator(s), any imposition of sanctions, and the rationales for the determination and sanctions including how the evidence was weighed, how the information supports the result, and the standard of evidence applied. The written notice will also include information about the procedures for appeal, as set forth below, and when the result becomes final. In addition, the written notice shall include any other steps the College has taken to eliminate the conduct and prevent its recurrence and the complainant's written notice will include remedies offered or provided to the complainant.

For all other complaints of sexual misconduct, the written notice shall include the determination of the adjudicator(s). The respondent's written notice shall include any imposition of sanctions and the complainant's written notice shall include any imposition of sanctions that directly relate to the complainant. The written notice will also include information about the procedures for appeal, as set forth below, and when the result becomes final. In addition, the written notice shall include any other steps the College has taken to eliminate the conduct and prevent its recurrence and the complainant's written notice will include remedies offered or provided to the complainant.

The College will strive to complete the adjudication process and provide a notice of outcome within twenty-one (21) calendar days after completion of the investigation (including completion of any additional investigation conducted at the request of the adjudicators). In some cases, more time may be required.

The determination of the adjudicator(s) may be appealed as provided below. In the event that no appeal is filed within the time periods prescribed below, the decision will be final.

## Appeal

Either the complainant or the respondent may appeal the results of the formal resolution process on one or more of the following grounds:

- a procedural error occurred that substantially affected the outcome of the process;
- significant newly-discovered evidence that was not previously available to submit during the complaint resolution process may substantially affect the outcome of the process; however, intentional omission of factual information by the appealing party is not a ground for an appeal; or
- the sanction or other response by Dunwoody under the formal resolution process was excessively severe or grossly inadequate.

## Submitting an Appeal

Following the determination, the complainant or respondent may request an appeal of the decision. The request for an appeal must be in writing, may not exceed 2,000 words, and must be submitted to the Title IX Coordinator within five (5) business days of receiving the notice of outcome. While the parties may be assisted by their advisors in preparation of the appeal, the appeal statement must be submitted by the party, must be the party's own statement, and may not be used to submit

the statements of others on the party's behalf. Failure to file a timely appeal constitutes a waiver of any right to an appeal.

The Title IX Coordinator or the Title IX Coordinator's designee will review the appeal to determine whether the appeal states a permissible ground for appeal (as set forth above), such that the appeal will be considered.

The non-appealing party will be notified of the appeal and the alleged grounds for the appeal. The non-appealing party may, if desired, submit a written response to the appeal, not to exceed 2,000 words, to the Title IX Coordinator within five (5) business days of receiving notice of the appeal.

The Title IX Coordinator or the Title IX Coordinator's designee(s) will review the appeal statement and any responsive appeal statement and may remove or redact any portions of the statements that exceed the permitted scope of the appeal or word limit or that otherwise exceed the scope of information that may be considered in the complaint resolution process (such as general character/reputation evidence and evidence relating to the complainant's prior sexual history). The Title IX Coordinator or the Title IX Coordinator's designee(s) generally will compile an appeal file, which may consist of any information, documents, recordings, or other evidence that is provided to the appeal panel. Such information may include, as applicable, the written appeal statement, the responsive appeal statement, the notice of outcome, the investigation file, the parties' initial written statements and rebuttal written statements, and any previously undiscovered evidence (if discovery of new evidence is a ground for appeal).

For complaints involving allegations of sexual assault, dating violence, domestic violence, or stalking, the appeal file will be made available for review by the complainant and respondent. The Title IX Coordinator or the Title IX Coordinator's designee(s) will provide a five (5) business day period for the complainant and respondent to have access to review the appeal file and such access generally will be provided during normal business hours in a designated on-campus location. The appeal file cannot be removed from that location, nor can copies be made or pictures taken of the contents.

Appeals will be considered by an appeal panel appointed by the Title IX Coordinator or the Title IX Coordinator's designee. Generally, appeal panels will consist of three trained individuals. The parties shall receive written notice of the appeal officers appointed. If any party has a concern that the appeal officers have a conflict of interest, the party should report the concern in writing as indicated in the Conflicts section above.

## Consideration of Appeal

In an appeal the burden of proof is on the appealing party to show that it is more likely than not that one or more of the above grounds for appeal are satisfied.

The appeal panel will not rehear the case, but will review the appeal file and consider whether it is more likely than not that the above-listed grounds for appeal have been satisfied and impacted the outcome of the process. If the appeal panel determines that the appealing party has demonstrated that it is more likely than not that one of the above grounds for appeal is satisfied, generally, the matter will be remanded for further investigation and/or deliberations by adjudicators, as determined by the appeal panel. If the appeal panel grants an appeal finding the imposed sanction to be excessively severe or grossly inadequate, the appeal panel has the discretion to modify the sanctions determination or to remand the matter to adjudicator(s) for a new sanctions determination. If the

appeal panel modifies the sanctions determination, the appeal panel's sanctions decision will be subject to an appeal.

When the matter is remanded, the appeal panel will determine whether the matter should be remanded to the original adjudicator(s) or whether new adjudicator(s) should review the matter. The appeal panel may not change adjudicator(s)' determination of whether the respondent was responsible or not responsible for a Policy violation. Only the adjudicators reviewing the matter on remand from an appeal may change the determination of the original adjudicators of whether the respondent was responsible or not responsible for a Policy violation. If the reasons for remand relate to the investigation or warrant additional investigation, the appeal panel will determine whether the matter should be remanded to the previous investigator or whether a new investigator should be appointed.

If the appeal panel determines that the appealing party has not demonstrated that it is more likely than not that one or more grounds for appeal have been satisfied, the appeal panel will dismiss the appeal. This decision is final and is not appealable.

The appeal panel will issue a written decision to the complainant and respondent stating the appeal panel's findings and the final disposition of the appeal. The College will strive to complete the appeal within thirty (30) calendar days following the appeal panel's receipt of the appeal file from the Title IX Coordinator; however, in some cases, more time may be required.

Appeals arising out of alleged violations of this policy must be made under this appeal process and are not eligible for consideration under faculty, staff or student grievance policies or processes.

Sanctions generally will take effect immediately, notwithstanding an appeal. A request may be made to the Title IX Coordinator to defer the effective date of sanctions in exigent circumstances. In cases where the appeal results in reinstatement to the institution or of privileges, all reasonable attempts will be made to restore the individual to his or her prior status.

## Complaints of Retaliation, Violation of Interim Measures, and Violation of Sanctions

Any complaint relating to retaliation in violation of this Policy, violations of interim measures, or violations of sanctions should be reported promptly to the Title IX Coordinator. The College will take appropriate action against any individual who retaliates against another person in violation of this Policy or who violates interim measures or sanctions.

When the College receives a complaint of retaliation or of violations of interim measures or sanctions, the Title IX Coordinator may exercise discretion to determine an appropriate responsive process based on the facts and circumstances. At the Title IX Coordinator or the Title IX Coordinator's designee(s)' discretion, options for resolution include but are not limited to informal discussions and resolution facilitated by the Title IX Coordinator or the Title IX Coordinator's designee(s) or assignment of a designated individual to investigate the complaint and determine an appropriate response. This process will be separate and distinct from the Complaint Procedures outlined above for addressing sexual misconduct complaints. The Title IX Coordinator or the Title IX Coordinator's designee(s) will document the complaint received, the process used, and the outcome. The College will notify the parties of the

outcome of the complaint. Any party with concerns about the process or outcome should consult with the Title IX Coordinator.

## Alternative Procedures

Nothing in this Policy is intended to interfere with the right of any individual to pursue other avenues of recourse which may include, but are not limited to, filing a complaint with the United States Department of Education's Office for Civil Rights (OCR).

The OCR Office for institutions located in Minnesota is:

U.S. Department of Education  
Office for Civil Rights  
Citigroup Center  
500 W. Madison St., Ste. 1475  
Chicago, IL 60661-4544  
Tel: 312-730-1560  
TDD: 877-521-2172  
Email: OCR.Chicago@ed.gov

## Resources

### What to do if you are sexually assaulted

- Get to a safe place.
- Call 911 if in immediate danger, if you are injured, or the community is in possible danger.
- Consider securing immediate professional support on or off campus to assist you in the crisis.
- Seek a medical evaluation for personal wellness/testing and possible evidence collection, even if you are uncertain you want to press charges or pursue legal action. For your safety and well-being, immediate medical attention is encouraged. Further, being examined as soon as possible, ideally within 24 hours, is important in the case of sexual assault. The hospital will arrange for a specific medical examination at no charge.
- Take steps to preserve evidence, which may be necessary to the proof of criminal sexual violence or in obtaining a protection order. It is very important to preserve evidence. You may not know right now whether you will contact the police. But in case you later decide to, the evidence available immediately after the assault is crucial. To preserve evidence follow these recommendations: Prior to seeking medical attention, do not shower, bathe, wash your hands, brush your teeth, use the toilet or clean up in any way. Bring another set of clothes to the hospital since clothes will be collected as part of the evidence. If you have changed clothes, bring your soiled clothing with you for evidence collection. Additionally, you are encouraged to gather bedding, linens or any other pertinent articles that may be used for evidence. Secure them in a clean paper bag or clean sheet. Evidence found in phone records (texting), e-mails, and/or social media (Facebook, Snapchat, etc.) should also be preserved.
- Even after the immediate crisis has passed, contact confidential on-campus and/or off-campus resources—for emotional support, information, and/or advocacy.
- Report the conduct to the Title IX Coordinator at 612-381-8236. The Title IX Coordinator can arrange for interim measures and accommodations, including no contact orders. The College will also assist in any needed advocacy for students who wish to obtain protective or restraining orders with local authorities. Alternatively, you can contact the Minneapolis Police Department or Hennepin County District Court to obtain protective or restraining orders.
- File criminal charges with the local Police Department, if desired. Designated staff members will help the employee or student in reporting the assault to the police and/or in filing a criminal charge.

## Emergency Contacts:

24-Hour Emergency – Local law enforcement: 911

## On Campus Resources:

Carla Pogliano Connor, Ph.D.  
Vice Provost for Program Development and Compliance  
Title IX Coordinator, Rehabilitation Act Coordinator, and Age Discrimination Act Coordinator  
612-381-8236  
cconnor@dunwoody.edu (cpogliano@dunwoody.edu)

Patricia Edman  
Vice President of Human Resources  
612-381-3308  
pedman@dunwoody.edu

Kelli Sattler  
Dean of Students  
612-381-3437  
ksattler@dunwoody.edu

Dunwoody Student Services Office  
612-374-5800  
studentaffairs@dunwoody.edu

Dunwoody's Employee Assistance Program:  
Cigna's Life Assistance Program 24/7  
1-800-538-3543  
apps.cignabehavioral.com/home.html (<http://apps.cignabehavioral.com/home.html>)

## Off Campus Resources:

RAINN (Rape, Assault, and Incest National Network)  
rainn.org (<https://www.rainn.org>)  
800-656-HOPE  
24-hour hotline; free and confidential

Sexual Offense Services  
St. Paul, Minnesota  
ramseycounty.us/residents/health-medical/clinics-services/sos-sexual-violence-services (<http://ramseycounty.us/residents/health-medical/clinics-services/sos-sexual-violence-services>)  
651-643-3006  
24-hour hotline; free and confidential

Sexual Violence Center  
Minneapolis, Minnesota  
sexualviolencecenter.org (<http://www.sexualviolencecenter.org>)  
612-871-5111  
24-hour hotline; free and confidential

Domestic Abuse Service Center<sup>1</sup>  
mncourts.gov/district/4/?page=369 (<http://www.mncourts.gov/district/4/?page=369%20%20>)  
Hennepin County Government Center Rm. #A-0650 (lower level)  
300 S. 6th St.  
Minneapolis, MN 55487

612-348-5073

Minnesota Office of Justice, Crime Victims Programs  
[dps.mn.gov/divisions/ojp/Pages/default.aspx](http://dps.mn.gov/divisions/ojp/Pages/default.aspx) (<http://dps.mn.gov/divisions/ojp/Pages/default.aspx>)  
 (Monday - Friday, 8:00 a.m. – 4:30 p.m.)  
 651-201-7300 or 1-888-622-8799, ext. 1 for financial help  
 1-800-247-0390, ext. 3 for information and referral  
 651-205-4827 TTY

#### Resource list for victims:

[dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/resource-list-victims.aspx](http://dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/resource-list-victims.aspx) (<https://dps.mn.gov/divisions/ojp/help-for-crime-victims/Pages/resource-list-victims.aspx>)  
 Hennepin County Victim Services  
 Hennepin County Attorney's Office  
[hennepinattorney.org/get-help/crime/victim-services](http://hennepinattorney.org/get-help/crime/victim-services) (<http://www.hennepinattorney.org/get-help/crime/victim-services%20%20>)  
 612-348-4003

[Lawhelpmn.org](https://www.lawhelpmn.org) (<https://www.lawhelpmn.org>) (Legal information on a variety of sexual assault issues)  
[lawhelpmn.org/issues/abuse-violence-crime-victims-rights/sexual-assault-and-other-crime-victims](https://www.lawhelpmn.org/issues/abuse-violence-crime-victims-rights/sexual-assault-and-other-crime-victims) (<https://www.lawhelpmn.org/issues/abuse-violence-crime-victims-rights/sexual-assault-and-other-crime-victims>)

Walk-In Counseling Center  
 (Free Mental health Counseling) [walkin.org](http://www.walkin.org) (<http://www.walkin.org>)  
 (check website for hours)  
 2421 Chicago Ave. S.  
 Minneapolis, MN 55404  
 612-870-0565 x 100

<sup>1</sup> The Domestic Abuse Service Center is available to help victims of domestic abuse (abuse by a family or household member) obtain orders for protection. In addition, harassment restraining orders are available for other types of harassment and assault. [mncourts.gov/district/4/?page=763](http://mncourts.gov/district/4/?page=763) (<http://mncourts.gov/district/4/?page=763%20>) **Victims do not have to report conduct to police to obtain a harassment restraining order. Dunwoody requires all students and employees whose conduct is subject to an order for protection or harassment restraining order to comply with such orders.**

## Health Care Options:

Hennepin County Medical Center  
 Sexual Assault Resources Service  
 612-873-5832  
 701 Park Ave.  
 Orange Building, 2.220  
 Minneapolis, MN 55415

Hennepin County Medical Center Sexual Assault Resources Service (SARS) provides assistance to victims of rape and sexual assault through area hospital emergency departments 24 hours a day. SARS counselors meet with victims and their families at HCMC and other participating hospitals to complete the evidentiary exam and to help them cope with the trauma and consequences of the assault.

Sexual Assault Nurse Examiners (SANEs) perform a special exam and collect evidence in a "rape kit." There is no charge for the SANE exam.

You can have a SANE exam within 120 hours after the rape or sexual assault. The purpose of the SANE exam is to collect forensic evidence, receive preventative health care, and see if you have any physical injuries that need tending. The exam will take place at the sexual assault exam site, in a confidential room with trained staff and volunteers. During the exam, the SANE will collect evidence such as your clothing, DNA swabs, etc. Prior to the exam, preserve all evidence and do not shower, bathe, change clothes, douche, brush teeth, drink or eat, or throw away any clothing until police or medical personnel say it is okay. If you have done any of the above, it is still possible to do an exam, but it is not as effective. So if possible, please try to avoid any of these actions. Completing a SANE exam does not require you to file a police report. But, it does help preserve evidence in case you decide to file a police report at a later date.

## Visa and Immigration Assistance:

US Citizenship and Immigration Services  
 2901 Metro Drive Ste. 100  
 Bloomington, MN 55425

## Student Financial Aid:

Financial Aid Office: 612-381-3347



# CAMPUS SECURITY & SCHOOL CLOSING INFORMATION

## Campus Safety

Access to the Dunwoody campus is restricted to normal business hours, which are generally 6 a.m. until 10 p.m., Monday through Friday, during the academic year. Weekend and summer hours may vary.

Public Safety Officers are on duty during business hours. To request escort service, visit the Public Safety desk.

In compliance with the Federal Campus Security Act, the College publishes an annual Campus Security Plan and Report which is available at [dunwoody.edu/pdfs/About\\_SafetyReport.pdf](http://dunwoody.edu/pdfs/About_SafetyReport.pdf) ([http://www.dunwoody.edu/pdfs/About\\_SafetyReport.pdf](http://www.dunwoody.edu/pdfs/About_SafetyReport.pdf)).

This report includes campus crime statistics for the most recent three-year period and a broad range of institutional policies concerning campus security. These policies pertain to alcohol and drug use, crime prevention, the reporting of crimes, sexual assault, and other important topics. A physical copy of this report can be obtained by contacting:

Dunwoody College of Technology  
ATTN: Finance & Administrative Services Coordinator  
818 Dunwoody Blvd.  
Minneapolis, MN 55403  
612-374-5800

If students have questions or concerns about this information, they should contact the Finance & Administrative Services Coordinator. Anyone wishing to view the daily crime log should also contact the Finance & Administrative Services Coordinator.

The Federal Sex Crimes Prevention Act, enacted on October 28, 2000, requires institutions of higher education to issue a statement advising the campus community where to obtain law enforcement agency information provided by a state concerning registered sex offenders. It also requires sex offenders already required to register in a state to provide notice, as required under state law, of each institution of higher education in that state at which the person is employed, carries on a vocation, or is a student.

Information regarding individuals on the registered sex offenders list can be obtained at the following:

Minneapolis Police Department  
5th Precinct, 3101 Nicollet Ave. S.  
Minneapolis, MN 55408  
612-673-5707  
[doc.state.mn.us](http://doc.state.mn.us) (<http://doc.state.mn.us>)

## Emergency Procedures

Students will receive evacuation route information in the classroom.

Students should take notice of the location of stairways and exits in order to be properly oriented in the event of an emergency. If an evacuation is needed, the evacuation signal is a siren sound.

## Emergency Messages for Students

The College will make every effort to see that students receive messages of an emergency nature. Only emergency messages will be delivered to

students. Students should inform family members or significant others about this policy.

## School Closing Information

When Dunwoody College of Technology determines the campus will be closed due to inclement weather or other emergency situations, that decision will be announced in the following locations:

- TV channels 4 (WCCO); 5 (KSTP) and 45 (KSTC), and 11 (KARE)
- Cancellations.com: [cancellations.com](http://www.cancellations.com) (<http://www.cancellations.com>) (search for Dunwoody College)
- Dunwoody's Twitter account: [twitter.com/dunwoodycollege](http://twitter.com/dunwoodycollege) (<http://www.twitter.com/dunwoodycollege>)
- Dunwoody's Facebook account: [facebook.com/dunwoodycollege](http://www.facebook.com/dunwoodycollege) (<http://www.facebook.com/dunwoodycollege>)
- Dunwoody's Information Line at 612-381-3420
- Dunwoody website: [dunwoody.edu](http://www.dunwoody.edu) (<http://www.dunwoody.edu>)

# INFORMATION TECHNOLOGY SYSTEMS

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## Canvas & My.Dunwoody

Dunwoody's official learning management system (LMS) is Canvas, and you can access it at through LaunchPad. This is your primary classroom tool for your instructor to share content and documents.

My.dunwoody is an online portal of student information and resources. Available through LaunchPad, the portal provides links to check grades; schedule/registration, financial aid and account balance information, enrollment verifications, to a variety of resources, opportunities, and notifications.

Students use My.Dunwoody to register for classes, pay their bill, and view academic information such as grades, attendance, academic plans and unofficial transcripts.

## LaunchPad

LaunchPad (<http://launchpad.dunwoody.edu>) is your starting point to access all of Dunwoody systems. LaunchPad is accessible on and off campus. The icons displayed on your LaunchPad page are based on your constituency. There is a mobile app, called Classlink, available in the app market.

## Office 365

Through our campus agreement with Microsoft, Dunwoody has provided access to Office 365 for all students and employees. This automatically updatable, subscription-based software ensures students and employees always have the latest version of Word, Excel, PowerPoint, OneNote, and more for as long as you are a student or employee and the program continues. At no additional cost, benefits of the software include but are not limited to:

- Install on up to five compatible PCs and Macs, plus five tablets
- 1TB of storage with OneDrive for automatic device syncing
- Create, organize, and collaborate anytime, on your computer, tablet or phone
- Enjoy access to the latest versions of Office applications, features and services
- Use the same programs across all of your personal devices to ensure full file fidelity

## On-Campus Printing

Dunwoody provides a secure and convenient way to print called Dunwoody Pharos. The method of printing allows you to use your ID badge to authenticate to print devices and release jobs for printing. You will be able to print to any device that is available for general use, and at this time, there is no direct charge for printing.

IT is responsible for maintaining this system and monitors the printers for errors. Contact the IT Service Desk if you have problems retrieving print jobs. If a printer is malfunctioning, you should notify the IT Service Desk and use another printer on campus.

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