ELECTRICAL CONSTRUCTION & MAINTENANCE (ELEC), AAS

At Dunwoody College of Technology, the Electrical Construction & Maintenance program 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 of 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 (https://catalog.dunwoody.edu/catalog-student-handbook/academic-programs/construction-sciences-building-technology/construction-management-cmgt-bachelor-science/) | Business Management Leadership (AMGT), Bachelor of Science (https://catalog.dunwoody.edu/catalog-student-handbook/academic-programs/construction-sciences-building-technology/construction-management-cmgt-bachelor-science/)

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

Code	Title	Credits
General Requirements		
MATH1000	Algebra & Trigonometry	3
Communications Elective		3
Humanities Elective		3
Physical/Environmental Science/Lab Elective		3
Social Sciences Elective		3
Technical Requirements		
ELEC1111	AC & DC Electrical Lab	5
ELEC1113	AC & DC Electrical Principles	7
ELEC1114	Introduction to the NEC	1
ELEC1115	Basic Skills of an Electrician	2
ELEC1211	AC & DC Machines & Controls Lab	5
ELEC1213	AC & DC Machines Principles	6
ELEC1214	National Electrical Code-Equipment	1
ELEC1215	Plans & Estimates for Electricians	2
ELEC2111	Wiring & Electrical Systems Lab 1	5
ELEC2113	Residential Wiring Electrical Principles	6
ELEC2114	National Electrical Code-Materials	1
ELEC2115	Building Automation Systems	2
ELEC2211	Wiring & Electrical Systems Lab 2	5
ELEC2213	Commercial Wiring Electrical Principles	6
ELEC2214	National Electrical Code-Special Topics	1
ELEC2215	Alternative Energy	2
Total Credits		**72**

Courses

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.

ELEC1113 | AC & DC Electrical Principles | Lecture (7 Credits)
Examine 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.
Corequisite(s): ELEC1115

ELEC1114 | Introduction to the NEC | Seminar (1 Credit)
Introduction to the National Electrical Code through investigation of the history to formulate a necessary base knowledge in which to develop basic skills and understanding of the NEC and how it applies to the electrical applications in the field.

ELEC1115 | Basic Skills of an Electrician | Lecture/Laboratory (2 Credits)
Introduce basic skills utilized in the electrical industry through hands-on training in basic tool use and safety protocols. Identify professional development opportunities and required industry ethics to prepare for your electrical career.
Corequisite(s): ELEC1113

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.

ELEC1213 | AC & DC Machines Principles | Lecture (6 Credits)
Examine AC and DC machine principles and theories and various control types with an emphasis on industrial manufacturing system calculations and analysis, including use of the National Electrical Code regulations for installations.

ELEC1214 | National Electrical Code-Equipment | Seminar (1 Credit)
Explore the National Electrical Code requirements for the safe installation of equipment in general use through the interpretation and calculations of the requirements utilized in the electrical industry.

ELEC1215 | Plans & Estimates for Electricians | Lecture/Laboratory (2 Credits)
Investigate construction drawings, specifications, estimates, and sequencing through the interpretation of various symbols, take-off methodologies, cost analysis, and planning utilized in the electrical industry.

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 ELEC1113

ELEC2113 | Residential Wiring Electrical Principles | Lecture (6 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 electrical systems.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

ELEC2114 | National Electrical Code-Materials | Seminar (1 Credit)
Examine the National Electrical Code requirements for the safe installation, maintenance and protection of electrical systems utilized in the construction and maintenance industry.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

ELEC2115 | Building Automation Systems | Lecture/Laboratory (2 Credits)
Analyze Building Automation Systems (BAS) containing Class 1, 2, and 3 wiring, remote control and signaling such as fire alarms, security, phone, and data through the identification of wiring methods and materials.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

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): ELEC1113 And ELEC1111

ELEC2213 | Commercial Wiring Electrical Principles | Lecture (6 Credits)
Examine the methods and materials used for the design, operation, estimation, layout, and installation of commercial and industrial electrical systems utilizing applicable industry standards along with the National Electrical Code.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

ELEC2214 | National Electrical Code-Special Topics | Seminar (1 Credit)
Examine the specialty topics in the National Electrical Code, including but not limited to special locations, equipment, and occupancies for the electrical industry.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

ELEC2215 | Alternative Energy | Lecture/Laboratory (2 Credits)
Investigate alternative energy methods, including common and uncommon power generation utilized in today's world.
Prerequisite(s): ELEC1111, ELEC1113, ELEC1114, And ELEC1115

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