ENG1110 | 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, taps, knurling, boring, radii cutting and milling procedures such as squaring stock, the use of rotary table and the many other milling and turning operations.
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, taps, knurling, boring, radii cutting and milling and turning procedures.
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.
Corequisite(s): MACH1110

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

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.
Corequisite(s): MDES1210

MDES2210 | Transmission of Power Lab | Laboratory (5 Credits)

MDES2210 | Transmission of Power Theory | Lecture (4 Credits)

Total Credits: 72
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)
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.
Corequisite(s): CMGT2203 HEAT1110
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