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

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.

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

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.
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