CAD Technology (CADT)

CADT 1100 Introduction to AutoCAD **3 Credits**

Prerequisite: ENGR 1000 or ITIS 1000 or ITIS 1005.

This course introduces students to freehand and geometric constructions commonly used in engineering technology, including methods for multiple views and three-dimensional presentation. Students will apply these principles to common machine elements such as fasteners. The course also introduces students to computer aided design (CAD) through the use of AutoCAD application software. Topics include the use of units, prototype development, computer drawing tools, dimensioning, and printing options. Students must provide a sketching set.

(6 contact hours: 1.5 lecture, 4.5 lab)

CADT 1500 Advanced AutoCAD **3 Credits**

Prerequisite: CADT 1100.

This course is a continuation of CADT 1100 Introduction to AutoCAD, emphasizing advanced features of AutoCAD, including combinations of drawing entities (blocks), the breakup of drawing entities (explosion), attribute labels, dimensioning and tolerancing rules, view generation from a three dimensional part, and customization of AutoCAD menus and digitizers.

(6 contact hours: 1.5 lecture, 4.5 lab)

CADT 2100 Introduction to SolidWorks **3 Credits**

Prerequisite: MATH 1080 or MATH 1400 (may be taken concurrently) or MATH 1650 (may be taken concurrently); or permission of instructor.

This course introduces students to three-dimensional solid modeling of discrete components and assemblies using SolidWorks software. Topics include advanced assembly modeling, part modeling, drafting with part and assembly print, and bill of material creation. Laboratory experience includes a major product design project and techniques to develop sweeps, linear patterns, circular patterns, lofts, sheet metal parts, multi-faced shells, revolved features, variable radii, fillets, molds, and initiation of rapid prototyping.

(6 contact hours: 1.5 lecture, 4.5 lab)

CADT 2500 Advanced SolidWorks **3 Credits**

Prerequisite: CADT 2100.

This course is intended to enhance the existing skills developed in CADT 2100 Introduction to SolidWorks. Topics include advanced sketch management, 3D sketching principles, advanced parametric shapes, 3D surfacing, advanced filleting, feature library creation, "design in context" principles, assembly level features, weldment design, mold design using core and cavity methodologies, thin walled plastic part design, advanced detail and assembly drawing creation, fundamental photorealistic rendering, leveraging legacy DXF and DWG drawings into 3D design projects and basic file management techniques using SolidWorks Explore. Design projects will apply procedures and methods for specific manufacturing processes such as mold (core and cavity) design, sheet metal enclosure design, weldment design, freeform design, and final 3D design proposal presentation.

(6 contact hours: 1.5 lecture, 4.5 lab)

CADT 2600 SolidWorks Design Productivity **3 Credits**

Prerequisite: CADT 2500.

This course is intended to enhance the existing skills developed in CADT 2500 Advanced SolidWorks. It focuses on enhancing students' design skills utilizing 3D capabilities of SolidWorks. Topics include Design Productivity Tools (Toolbox, FeatureWorks, Utilities, Design Checker), Design Communication tools (PhotoWorks, Animator), Design Validation tools (Finite Element Analysis), Design Iteration tools (Part and Assembly level configurations, design tables, and automation for standard part design), Advanced Assembly Modeling (Advanced mates such as Cam, Gear, Rack and Pinion, and Belt/Chain), In-Context Design (Top-Down Assembly modeling, external references), Specialized Modeling techniques, and Design Efficiency tools (Design Libraries, Hole Wizard, Library Features, Smart Components, Macros). Students will submit a final project in accordance with course requirements.

(6 contact hours: 1.5 lecture, 4.5 lab)