Certificate: Computer-Aided Design and Drafting

Certificate Description:

This certificate provides students with a basic understanding of computer-aided design and drafting. This certificate is developed and granted by BYU-Idaho.

Course Code	Course Name	15 Credits
MATH 110X	College Algebra	3 Credits
ME 142	Engineering Computation I	3 Credits
ME 162	Computer-Aided Draft and Design	3 Credits
ME 172	Parametric Mechanical CAD	3 Credits
ME 272	Mechanical CADD and GD&T	3 Credits

Course Descriptions:

MATH 110X (3 credits) – College Algebra

This course includes the study of elementary analysis of functions having discrete or connected domains, methods of solving equations, and systems of equations and matrices. Strong connections to real-world applications of functions and matrices will be made. Students who will take calculus are strongly encouraged to take Math 109 instead of Math 110X.

ME 142 (3 credits) – Engineering Computation I

This course introduces computation in the context of engineering problem solving. Fundamental principles of computation, such as computer representation of numbers and round-off error, are presented. Basic numerical methods, including numerical integration, differentiation, and root finding, are covered. An introduction to computer programming, including flowcharts, loops, condition statements, and functions, is given. Emphasis is placed on using Microsoft Excel to solve computational problems, VBA within Excel to create computer programs, and a commercial math software package.

ME 162 (3 credits) – Computer-Aided Draft & Design

Computer-aided drafting and design using AutoCAD software. Topics include coordinate systems, display control, basic geometric construction and editing, scales, layer, annotation and dimensions, blocks, attributes, and plotting. Applications in mechanical, civil, electrical, and architectural disciplines.

ME 172 (3 credits) – Parametric Mechanical CAD

This course is designed to help students develop employable and certifiable skills in parametric CAD modeling of mechanical components and assemblies. Students will work toward associate-level and then professional certification in SolidWorks and have the opportunity to take the CSWA and CSWP exams. The course focuses on training students to think parametrically and to strategically capture design intent within 3D-CAD models and assemblies.

ME 272 (3 credits) – Mechanical CADD and GD&T

This course focuses on mechanical drafting and geometric dimensioning and tolerancing (GD&T). Students will learn ANSI and ISO standards and become proficient using SolidWorks CADD to create working drawings, which communicate product manufacturing information.

Outcomes:

- Analyze and solve problems involving functions, algebraic expressions, and systems of equations.
- Demonstrate proficiency using a spreadsheet program, Excel (formulas, functions, graphs, solver, pivot tables).
- Show proficiency in writing computer programs in VBA, including variables, conditional expressions, loops, and arrays.
- Demonstrate proficiency in using a 2D-modeling program, AutoCAD, in the creation of models and drawings.
- Show proficiency in using a 3D-parametric modeling program, SolidWorks, in the creation of basic mechanical components, assemblies, and drawings.
- Create and interpret geometric dimensions and tolerances (GD&T) for mechanical engineering drawings.

Potential Employment:

- AutoCad/Solidworks drafter/designer