

EID-102 Syllabus

Revised 9/1/2017

Course Catalog Description

An introduction to graphical representation of 3-dimensional objects. After learning the principles of technical drawing using precision hand tools, students utilize CAD software to create professional caliber engineering drawings. An introduction to solid modeling is given. Topics include orthographic projections, linetypes, geometric dimensioning and tolerancing, layers, layouts, solid modeling, part assemblies and finite element analysis.

Syllabus

Week 1 – Introduction and course overview

Week 2 – Technical drawing tools overview, introduction to orthographic projections

Week 3 – Lintypes: hidden lines, center lines

Week 4 – Dimensioning and annotation

Week 5 – Section views and auxiliary views, discussion of working drawings

Week 6 – Introduction to vector graphics, CAD, and CAM

Week 7 – AutoCAD overview

Week 8 – AutoCAD: Layers, linetypes

Week 9 – AutoCAD: Layouts, blocks, attributes

Week 10 – Introduction to 3D CAD, Solid models

Week 11 – Solidworks: overview, part modeling

Week 12 – Solidworks: Assemblies, drafts, FEA discussion

Week 13 – Excel

Week 14 – Matlab

Discussion:

Weeks 2 through 9 are designed to cover the ASME Y14.5 (dimensioning and tolerancing) standard. The goal is to convey a familiarity with basic portions of the standard so as to empower students to create drawings that accurately communicate their needs to other engineers and machinists. A variety of tools and techniques are taught to emphasize the content (the standard) not the tool.

Technical Drawing (“hand drafting”) is taught in weeks 2 through 5. The primary reasoning for teaching these topics by hand first is two-fold:

- 1) While engineers will likely do most of their work on computers later in their careers, the ability to sketch and annotate ideas during meetings, dinners, and outings where CAD might not be available, is a desirable skill.
- 2) Studies have recently shown that sketching (by hand) and taking notes on paper help retain lessons faster and longer than typing and using a mouse.

Weeks 10 through 12 cover 3D modeling with discussions about all the directions 3D modeling go: rapid prototyping, CAM, finite element analysis etc.

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Weeks 13 and 14 discuss when to (and when not to) utilize Excel and Matlab to aid in solving assignments as students. Emphasis is made on utilizing what each package does well for completing lab reports.