

EID-102 Syllabus

Revised 9/1/2019

EID-102

EID-102 – Engineering Graphics

1 credit and 1 contact hour per week

Coordinator: Brian Cusack, Adjunct Professor of Mechanical Engineering

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.

Goals:

- Application of fundamentals of ASME Y14.5
- Develop professional attributes through producing work to adhere to engineering standards

Specific Goals of Course:

- i. Outcomes of instruction
 - Understanding of the fundamentals of GD&T; ASME Y14.5
 - Basic proficiency in hand drafting
 - Basic proficiency in 2D CAD
 - Basic proficiency in solid modelling
- ii. Student Outcomes (Primary)
 - (a) Homework is assigned weekly to cover the main topics of engineering design graphics; these assignments are reviewed and returned with notes
 - (c,e,f,g,i,k) A large final project of the students choosing is assigned; this project is intended for the student to self-teach the next stage of learning within a topic/software and media of their choosing.
- iii. Student Outcomes (Secondary)
 - (c,e,f,g,i,k) Students are required to submit a final project proposal for approval and discuss the lessons they expect to learn from the experience.

Brief List of Topics Covered:

- Introduction to technical drawing tools
- Orthographic projections
- Lintypes
- Dimensioning and annotation
- Section views and auxiliary views

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- 2D CAD - AutoCAD - layers, linetypes, layouts, blocks, attributes
- Solid Modelling – Solidworks – parts, assemblies, drawings, FEA
- Excel
- 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.

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.

Additional Information

Grading policy – Grading of all assignments is not negotiable except in cases of factual error.

Missed deadline policy – Assignments may be handed in late without reason given within 24 hours but will be graded 20% off. No assignment will be accepted after 24 hours without documented medical or other emergent reason.

Policy on extra work – No extra credit projects will be assigned or accepted.

Policy on plagiarism – Every student must do their own work and any assignment, project or exam with the student's name on it represents their statement that it is their original work. While students are encouraged to teach each-other, answer each-other's questions and act as available colleagues in consultation, each student's work must be their own. Any student caught cheating will be failed for the course and the incident will be reported to the dean's office.

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Use of electronic devices – Use of personal electronic devices is allowed in class so long as they do not become a distraction to those around them. It is, however, recommended that notes be taken on paper, as has been shown to be more valuable a learning methodology than typing.

Disability accommodations - Students seeking accommodations due to a condition covered by the Americans with Disabilities Act are required to formally self-identify through the Office of Dean of Students. The Dean of Students will work with the students to clarify requested accommodations. It is the student's responsibility to speak directly to me to see how their accommodations can be met.

Medical absences - Students who have medical excuses for missing class should contact the Dean of Students promptly. Students will be required to provide the Dean of Students with documentation from a medical provider justifying the absence. The Dean of Students will inform me when an absence is due to a valid medical issue/condition so that the absence can be considered excused. It is important to note that even with excused medical absences; a student is still responsible for completing all of the course requirements. If a student's absences have resulted in their missing vital components of in-class discussions and experiences, students may be required to withdraw from a course and retake it even with valid medical excuses. This is entirely at the discretion of the faculty member teaching the course. In addition to communicating with the Dean of Students, students must remain in regular communication with the faculty teaching the course when they need to miss a class.