

Industrial Engineering 101: Fundamentals of Graphics

Textbook: Engineering Graphics (7th Edition), Giesecke et al, Prentice Hall, 2001
Engineering Drawing Problems Series 1, Giesecke et al, Prentice Hall, 1997.

Prerequisites:

- Basic trigonometry or concurrent enrollment

Course Objectives:

- Understand engineering graphics as a form of communication
- Understand the principals of orthographic, pictorial, and auxiliary projection
- Recognize and understand the basic drawing conventions
- Build freehand sketching skills
- Exposure to ASME standard dimensioning; including axial and diametric tolerance and geometric tolerancing
- Build basic aptitude in 2 and 3D solid CAD modeling
- Begin working in a group environment

Topics Covered:

- Drawing instruments, lettering, alphabet of lines, basic geometric constructions
- Freehand sketching
- Orthographic projection
- Conventional Practices
- Pictorial drawings
- Sectional views
- Single auxiliary views
- Successive auxiliary views
- Views of revolution
- Working drawings and manufacturing processes
- Threads, threaded fasteners and other standard parts
- Dimensioning
- Diametric and axial tolerances
- Geometric tolerances

Project:

Each student is to work on a group CAD assignment for the second half of the semester. Groups consist of 3 to 4 students from the same class section. Project is to create CAD models for a multi- component part and then from those models create necessary detail and assembly CAD drawings.

Major Assignment:

Students are expected to answer a series of questions from the information contained in a small set of engineering prints. This assignment also requires the student to refer to tables of standard part sizes and tolerances.

Class/Laboratory Schedule:

two-hour class sessions (2 hrs/each) split equally between lecture and laboratory per week.

Contribution of Course to Meeting the Professional Component:

- Students build the ability to communicate effectively using engineering drawing.
- Students will be able to interpret and create engineering drawings using both manually and using a CAD system.
- Students will be able to recognize the need and be able to create sectional and auxiliary views in addition to the standard orthographic views.
- Students will be able to apply standard ASME dimensions as well as be exposed to both linear and geometric tolerances.

Relationship to Program Objectives:

- (ii) Students will have experience in 2D and 3D solid CAD modeling using AutoCAD package
- (iii) Students learn graphics techniques to create engineering design drawings
- (iv) Students learn how to use AutoCAD to create engineering design drawings
- (viii) Students learn to work in a group to create CAD models for a multi-component part for assembly CAD drawings

Prepared by: Daniel Beller 10/28/01

Methods of Assessment:

- Course Evaluation by Students
- Graded Homework
- Graded Projects
- Evaluation by IAC
- Instructor Judgment

Resources Commonly Available:

- Instructor
- Use of CAE Lab Computers

Desirable Student Competencies:

- Ability to operate computer programs in the windows environment