

CATALOG INFORMATION

Dept and Nbr: ENGR 25 Title: ENGR GRAPH & DESIGN
Full Title: Engineering Graphics and Design
Last Reviewed: 2/24/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.50	17.5	Lecture Scheduled	43.75
Minimum	3.00	Lab Scheduled	1.50	17.5	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 87.50

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable
Grading: Grade Only
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Students will develop their three dimensional visualization and design skills using AutoCAD and Inventor software packages. Design projects will develop teamwork and project skills as well as an understanding of the industry standards for mechanical engineering drawings.

Prerequisites/Corequisites:
Course Completion of APTECH 46 (formerly APTECH 56) and MATH 27 (or MATH 25 and MATH 58)

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: Students will develop their three dimensional visualization and design skills using AutoCAD and Inventor software packages. Design projects will develop teamwork and project skills as well as an understanding of the industry standards for mechanical engineering drawings.
(Grade Only)
Prerequisites/Corequisites: Course Completion of APTECH 46 (formerly APTECH 56) and

MATH 27 (or MATH 25 and MATH 58)

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC. (CAN ENGR2)

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area			Effective:	Inactive:
CSU GE:	Transfer Area			Effective:	Inactive:
IGETC:	Transfer Area			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 1989	Inactive:	
UC Transfer:	Transferable	Effective:	Spring 1989	Inactive:	

CID:

Certificate/Major Applicable:

Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:

Upon successful completion of the course, students will be able to:

1. Make freehand pictorial and orthographic sketches of objects.
2. Construct auxiliary views and section views.
3. Apply the terminology and standards of geometric tolerancing to mechanical working drawings.
4. Construct solid models, working drawings and assemblies of objects using both boolean and parametric computer aided design software packages.
5. Apply teamwork skills in group activities and projects.
6. Describe models of the engineering design process and their key common features.
7. Organize and deliver an oral presentation on an engineering topic or project.

Topics and Scope:

1. Freehand sketching of isometric and orthographic views
2. Primary auxiliary views of objects
3. Section and detail views
4. Conventional dimensioning and tolerancing
5. Geometric dimensioning and tolerancing basics
6. American National Standards Institute hole basis fits
7. Algorithms for the engineering design process
8. Concurrent engineering and design for manufacturing concepts
9. Documentation standards for engineering projects
10. Common requirements for engineering presentations
11. Solid modeling primitives and model construction in AutoCAD
12. Part drawing construction and annotation in AutoCAD
13. Parametric modeling in Inventor

14. Part drawing construction and annotation in Inventor
15. Assembly drawing construction in Inventor
16. Introduction to finite element analysis
17. Engineering design team skills

Assignment:

1. 5-12 manual worksheets
2. 20-40 CAD drawings
3. 1 oral presentation
4. 1-2 design project documentation portfolios
5. 1-2 constructed models for engineering design project
6. 2-4 midterm exams
7. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Manual worksheets

Problem solving
5 - 20%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

CAD drawings, oral presentation

Skill Demonstrations
30 - 50%

Exams: All forms of formal testing, other than skill performance exams.

Short Answer, manual sketching and solutions, CAD models and drawings

Exams
15 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

Project design portfolio, constructed project

Other Category
10 - 20%

Representative Textbooks and Materials:

Earle, Engineering Design Graphics, 12th Edition, Prentice Hall, 2008

Jensen and Helsel, Engineering Drawing and Design, 7th Edition, McGraw Hill 2008
Shih, Parametric Modeling with Autodesk Inventor 2008, SDC Publications, 2007
Instructor prepared materials