

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

ENGINEERING 119 – BASIC ENGINEERING CAD

2 hours lecture, 4 hours laboratory, 3 units

Catalog Description

CAD (Computer-Aided Drafting) fundamentals for engineers. Basic drawing techniques and commands in AutoCAD. Includes geometric construction, multiview and singleview projections, section views, dimensions, and text. *Not open to students with credit in CADD 120, 120ABCD.*

Prerequisite

“C” grade or higher or “Pass” in CADD 115 or ENGR 100 or equivalent

Recommended Preparation

Working knowledge of basic computer operations and file administration

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Complete basic orthographic mechanical drawings.
- 2) Solve basic geometric construction with accuracy and detail.
- 3) Explain basic descriptive geometry of lines and planes.
- 4) Create sectional views.
- 5) Create isometric and oblique projections.

Course Content

- 1) AutoCAD commands and input methods
- 2) Beginning a new drawing with the new command
- 3) Opening an existing drawing with the open command
- 4) Working with multiple drawings
- 5) Constructing geometric figures
- 6) Using coordinate systems
- 7) Modify commands
- 8) Setting multiple viewports
- 9) Creating and modifying layer system
- 10) Setting the system variables
- 11) Using the dimension terminology
- 12) Planning the plotted sheet
- 13) Plotting a drawing
- 14) Applying the hatch boundary
- 15) Creating blocks and attributes

Course Objectives

Students will be able to:

- 1) Describe and apply basic AutoCAD terms, concepts and techniques.
- 2) Apply basic drawing commands in engineering drafting.
- 3) Construct 2D drawings with text and dimensions.
- 4) Perform basic editing commands to modify drawings.

- 5) Verify the integrity of drawing data using various inquiry commands.
- 6) Plot and print drawings in different scale configurations.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Student portfolio of drawing exercises and projects in which students demonstrate their skill and competency in using and applying mechanical and computer-aided drafting tools for engineering applications.
- 2) Midterm exam that measures the student's ability to describe and apply fundamental drafting concepts, terminology, and techniques used in engineering graphics.
- 3) Final exam that measures the student's capability as a draftsman. For example, the student will be required to use mechanical and/or computer drafting tools to produce graphic, auxiliary, and section views for 3D objects.
- 4) In-class activities (written/oral) that measure the student's ability to articulate fundamental drafting design and production skills required in the field of engineering graphics.

Special Materials Required of Student

USB flash drive (1GB or larger)

Minimum Instructional Facilities

CAD computer lab

Method of Instruction

- 1) Lecture and lab demonstration
- 2) Lab assignments and projects

Out-of-Class Assignments

- 1) Weekly homework
- 2) Portfolio

Texts and References

- 1) Required (representative example): Dix, Mark and Paul Riley. *Discovering AutoCAD 2017*. Pearson, 2017. ISBN 13: 9780134506876
- 2) Supplemental: Handouts

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Use of AutoCAD terms, concepts and techniques in engineering drafting and design.
- 2) Application of AutoCAD in 2D drawing.
- 3) Construction of 2D drawings with text and dimensions using AutoCAD.
- 4) Ability to perform AutoCAD's editing commands to make any necessary changes.
- 5) Verifying the integrity of drawing data using various inquiry commands.
- 6) Plotting and printing drawings in different scale configurations.

Student Learning Outcomes

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

- 1) Construct 2D geometry shapes using sketching skills and software.
- 2) Construct 3D geometric models by implementing the appropriate commands.
- 3) Produce orthographic projections including section and auxiliary views.
- 4) Apply dimensions and tolerances in drawings accordance with industry standards.