

### Course Outline

**COURSE:** ENGR 1                      **DIVISION:** 10                      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Spring 2013                      **CURRICULUM APPROVAL DATE:** 10/08/2012

**SHORT TITLE:** GRAPHICAL COMM AND DESIGN

**LONG TITLE:** Graphical Communication and Design

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
3	18	Lecture:	2	36
		Lab:	3	54
		Other:	0	0
		Total:	5	90

**COURSE DESCRIPTION:**

An introduction to the graphical and visual communication of the engineering design process. Topics will include the design process, visualization, free-hand sketching, instrument drawing, scales, orthographic projection, section views, auxiliary views, and dimensioning and tolerancing. Computer based drafting will be used in conjunction with traditional methods to highlight the strengths of multiple communication methodologies. **ADVISORY:** MATH 1A; may be concurrent.

**PREREQUISITES:**

**COREQUISITES:**

**CREDIT STATUS:** D - Credit - Degree Applicable

**GRADING MODES**

L - Standard Letter Grade

**REPEATABILITY:** N - Course may not be repeated

**SCHEDULE TYPES:**

02 - Lecture and/or discussion

03 - Lecture/Laboratory

04 - Laboratory/Studio/Activity

**STUDENT LEARNING OUTCOMES:**

1. Describe the engineering design process.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

2. Describe, compare, and contrast the various views to communicate an engineering design project.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

3. Describe, compare, and contrast the fundamental principles of orthographic projection to communicate an engineering design project.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

4. Describe, compare, and contrast the fundamental principles of descriptive geometry to communicate the details of geometric shapes necessary in the engineering design process.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

5. Describe, compare, contrast, and identify the methods for dimensioning parts and describing allowable production tolerances.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

6. Apply and demonstrate appropriate use and competency in the use of computer-aided-drafting software.

Measure: Homework, Exams and Lab.

PLO: 1, 3, 4

ILO: 7, 1

GE-LO: B1, 3, 5, 7, 8

Year assessed or anticipated year of assessment: 2013

## **CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 10/08/2012

Hours: 44

Topic: Sketching and Drawing

Student Performance Objectives:

1. Demonstrate use of basic drawing instruments to create 2- and 3-D sketches and/or drawings of common items including 3-D spatial visualization.
2. Identify, compare, contrast, and demonstrate various line types, scales and sizes.
3. Identify, compare, contrast, and demonstrate orthographic projection and descriptive geometry including isometric, oblique, sectional, and auxiliary views.

Out of Class Assignments: Reading from text. Homework problems from text and instructor.

Hours: 11

Topic: Dimensioning and Tolerancing

Student Performance Objectives:

1. Identify, compare, contrast, and describe dimensions and tolerances.
2. Identify, compare, contrast, and describe types of tolerances with their geometric characteristic.
3. Identify, set-up, and solve for tolerances on dimensions in the engineering design process.

Out of Class Assignments: Reading from text. Homework problems from text and instructor.

Hours: 33

Topic: Computer Aided Drafting

Student Performance Objectives:

1. Demonstrate use of basic drawing instruments to create 2- and 3-D sketches and/or drawings of common items including 3-D spatial visualization.
2. Identify, compare, contrast, and demonstrate various line types, scales and sizes.
3. Identify, compare, contrast, and demonstrate orthographic projection and descriptive geometry including isometric, oblique, sectional, and auxiliary views.

Out of Class Assignments: Reading from text. Homework problems from text and instructor.

Hours: 2

Topic: Final Exam

**METHODS OF INSTRUCTION:**

Lecture/discussion/laboratory

**METHODS OF EVALUATION:**

CATEGORY 1 - The types of writing assignments required:

Percent range of total grade: 0 %

If this is a degree applicable course, but substantial writing assignments are not appropriate, indicate reason:

Course primarily involves skill demonstration or problem solving

CATEGORY 2 -The problem-solving assignments required:

Percent range of total grade: 100 % to 100 %

Homework Problems

Lab Reports

Exams

**REPRESENTATIVE TEXTBOOKS:**

Required:

Bertoline, Gary R., Fundamentals of Graphics Communication for Engineers, McGraw Hill, 2011, or other appropriate college level text.

Reading level of text, Grade: 13 Verified by: Russell Lee using MS Word

Other textbooks or materials to be purchased by the student: Basic drafting supplies including, ruler, pencil, eraser and erasing shield, scale, triangles.

#### **ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 200470

UC TRANSFER:

Transferable UC, effective 200470

#### **SUPPLEMENTAL DATA:**

Basic Skills: N

Classification: A

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN: ENGR2

CAN Sequence: XXXXXXXX

CSU Crosswalk Course Department: ENGR

CSU Crosswalk Course Number: 1

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: E

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000117011

Sports/Physical Education Course: N

Taxonomy of Program: 090100