COURSE OUTLINE

Course Number	Course Title	Credits
ENT116	**Engineering Graphics**	**2**
Hours: Lecture/Lab/Other	**Co- or Pre-requisite**	**Implementation Semester & Year**
1/2/0	**ENG033 and MAT033 or divisional permission**	**Spring 2022**

Catalog description:
Broad-based course in basic graphic concepts of engineering drawing, including such topics as orthographic projection, sectioning, isometric drawing, and dimensioning.

General Education Category:
Not GenEd

Course coordinator:
James Maccariella, 609-570-3462, maccarij@mccc.edu

Required texts & Other materials:

Fundamentals of Graphic Communication, 6th edition
Bertoline, Wiebe, Hartman, Ross
McGraw Hill
ISBN-13: 978-0073522630

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Produce accurate and correct drawings. [Supports ILG 1, 11; PLO 4]
2. Produce neat and legible work. [Supports ILG 1, 11; PLO 4]
3. Demonstrate the standard principles of engineering graphics. These principles include the theories of orthographic projection, isometric drawing, standard dimensioning techniques, and sectioning operations of single parts. [Supports ILG 1, 11; PLO 4]

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1. Written and Oral Communication in English. Students will communicate effectively in both speech and writing.
Institutional Learning Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.
Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for Civil Engineering Technology (PLO)

1. Prepare designs for highways, buildings, and bridges.
2. Perform route/construction surveys using survey equipment and methods.
3. Test and analyze various construction materials.
4. Prepare design drawings.

Units of study in detail – Unit Student Learning Outcomes:

Unit I **Tools, Lettering, and Geometric Construction [Supports Course SLO #1, 2, 3]**

Learning Objectives
The student will be able to:

- Identify, care for, and manipulate properly all tools and equipment required in the course.
- Produce engineering lettering using single stroke gothic form, developed in proper guidelines.
- Produce with standard drafting equipment, but without templates, geometric constructions including hexagon, octagon, and other polygons.

Unit II **Orthographic Projection and Dimensioning [Supports Course SLO #1, 2, 3]**

Learning Objectives
The student will be able to:

- Produce accurate multi-view drawings of moderately complex shapes using standard orthographic third angle projection.
- Produce drawings in most standard scales (i.e. 1/4, 1/2, 3/4).
- Apply dimensions to a two or more view orthographic drawing either from given information or from scaling the drawing itself, according to A.N.S.I. Standards, using both aligned and unidirectional systems.
- State properly in limit and bilateral form, specific tolerances of size according to a prescribed class of fit.

Unit III **Sections [Supports Course SLO #1, 2, 3]**

Learning Objectives
The student will be able to:

- Draw a full, half or offset section view of an object of moderate complexity.
- Construct a revolved and broken out section from given orthographic views.

Unit IV **Isometric Drawing [Supports Course SLO #1, 2, 3]**

Learning Objectives
The student will be able to:

- Prepare a neat, accurate drawing in isometric form, from orthographic views, including circular shapes.
- Apply dimensions to at least one form of pictorial drawing in an acceptable form, according to text standards.
- Represent oblique and angular surfaces in an isometric drawing.

Evaluation of student learning:

Course student learning outcomes will be assessed by the following activities:

Drawings and Projects	70%
Quizzes and Homework	30%