



**MERCER**  
COUNTY COMMUNITY COLLEGE

## COURSE OUTLINE

Course Number	Course Title	Credits
CIV101	Surveying I	3
Hours: Lecture/Lab/Other	Co- or Pre-requisite	Implementation Semester & Year
2/3	MAT115 or approved equivalent; ENT116 or prior drafting experience; DRA190	Spring 2022

**Catalog description:**

Introduces the three basic surveying tools are introduced – the tape, level and transit/theodolite –along with proper field procedures for basic surveying which include taking field notes, taping and EDM, leveling, bearings and azimuths, topography, and mapping.

**General Education Category:**  
Not GenEd

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

**Required texts & Other materials:**

Elementary Surveying, 15<sup>th</sup> Edition  
Ghilani and Wolf  
Pearson  
ISBN-13: 9780134604657

**Course Student Learning Outcomes (SLO):**

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

1. Apply geometric and trigonometric principles to basic surveying calculations. [Supports ILG 2; PLO 1, 4]
2. Prepare accurate, legible and complete notes in a well-prepared field book. [Supports ILG 1; PLO 1, 2, 4]
3. Demonstrate field procedures in basic types of surveys. [Supports ILG 11; PLO 1, 2, 4]
4. Demonstrate awareness of the limitations of the basic surveying instruments and the possible errors that could arise. [Supports ILG 4, 11; PLO 2]
5. Apply drawing techniques in the development of a topographic map. [Supports ILG 1; 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 Program (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 Introduction, Taping [Supports Course SLO #1, 2, 3]**

##### **Learning Objectives**

###### ***The student will be able to:***

- Calculate line lengths, making corrections for temperature, alignment, sag, length and pull to record distances.
- Define plane and geodetic surveys.
- Define types of surveys.
- Identify sources of errors - natural, instrumental, personal
- Identify types of errors - systematic, accidental
- Measure direct and indirect measurements

#### **Unit II Level [Supports Course SLO #1, 2, 3, 4]**

##### **Learning Objectives**

###### ***The student will be able to:***

- Define leveling terms.
- Consider the effect of curvature and refraction.
- Determine differences in elevations.
- Operate automatic and hand levels.
- Perform various types of leveling procedures.
- Adjust a level circuit to be within the allowable closure.

#### **Unit III Theodolite and Total Station [Supports Course SLO #1, 2, 3, 4]**

##### **Learning Objectives**

###### ***The student will be able to:***

- Measure horizontal angles and distances.
- Operate a transit.
- Measure vertical angles with the transit.
- Compute bearings and azimuths.

#### **Unit IV Topography [Supports Course SLO #1, 2, 3, 4, 5]**

##### **Learning Objectives**

###### ***The student will be able to:***

- Prepare a topographic map.
- Understand horizontal and vertical control.
- Identify the methods used to obtain topography.

**Evaluation of student learning:**

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

Lab	30%
Tests (3)	45%
Quizzes	10%
Final Exam	15%