COURSE OUTLINE

Course Number: CIV101
Course Title: Surveying I
Credits: 3

Hours: Lecture/Lab/Other
2/3

Co- or Pre-requisite: MAT115 or approved equivalent; ENT116 or prior drafting experience; DRA190

Implementation: Semester & Year
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, 15th Edition
Ghilani and Wolf
Pearson

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:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>30%</td>
</tr>
<tr>
<td>Tests (3)</td>
<td>45%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
</tr>
</tbody>
</table>