

## **COURSE OUTLINE** **Surveying II**

### **Course Description**

SR 204. Surveying II. 3 hours credit. Prerequisite: SR 104 with a C or better or instructor approval. This course will enable the student to understand more advanced methods of surveying and prepares the student for more advanced surveying courses. The student will learn about contour maps and plans, cadastral surveying, traversing, latitudes and departures, balancing angles, and electronic distance measurement characteristics.

### **Course Relevance**

The concepts and theories taught in this course will allow the student to understand the fundamentals of surveying in preparation for more advanced survey courses.

### **Required Materials**

Kavanagh, B. F. (2006). *Surveying: principles and applications* (7<sup>th</sup> ed.). Columbus, OH: Prentice Hall.

### **Learning Outcomes**

The intention is for the student to be able to:

1. Use survey equipment
2. Know and apply advanced survey math skills

### **Primary Learning PACT Skills that will be DEVELOPED and/or documented in this course**

Through the student's involvement in this course, he/she will develop his/her ability in the following primary PACT skill areas:

1. Field-Related Technology
  - The student will be expected to demonstrate proficiency in setting up and operating survey equipment.

Secondary skills (developed but not documented):

Listening  
Nonverbal Communication  
Teamwork  
Ethical Conduct

### **Major Summative Assessment Task(s)**

These learning outcomes and the primary Learning PACT skills will be demonstrated by:

1. Completing a hands-on capstone field project correctly using survey equipment and math

### **Course Content**

- I. Themes – Key recurring concepts that run throughout this course:
  - A. Surveying methods
  - B. Surveying principles
- II. Issues – Key issues that will be addressed in this course: areas of conflict that must be understood in order to achieve the intended outcome:
  - A. Correct survey equipment setup and use
  - B. Accurate geometrical computations
  - C. Correct survey terminology
- III. Concepts – Key concepts that must be understood to address the issues:
  - A. Traverse surveying
  - B. Electronic distance measurement (EDM)
  - C. Topographic surveying and mapping
  - D. Geographic information systems (GIS)
  - E. Survey definition of terms
- IV. Skills / Competencies – Actions that are essential to achieve the course outcomes:
  - A. Demonstrate proficiency in setting up a total station
  - B. Identify key components of a total station
  - C. Demonstrate proficiency in taking measurements with a total station
  - D. Demonstrate how to solve advanced survey math problems
  - E. Accurately interpret survey terminology
  - F. Demonstrate an understanding latitudes and departures
  - G. Demonstrate how to compute latitudes and departures
  - H. Demonstrate knowledge of EDM principles
  - I. Demonstrate how to setup, aim, measure, and record EDM information
  - J. Demonstrate knowledge of EDM geometry
  - K. Demonstrate knowledge and use of survey station descriptors
  - L. Demonstrate and understanding of contour characteristics
  - M. Demonstrate how to interpret contours
  - N. Demonstrate how to use and interpret map scales and precisions
  - O. Demonstrate an understanding of cross sections, profiles, end areas, and volumes
  - P. Demonstrate how and when to use prismatic formula
  - Q. Define GIS and its relationship to surveying
  - R. Demonstrate an understanding of GIS principles

### **Learning Units**

- I. Cadastral surveying
  - A. Latitudes and departures
  - B. Meridians
  - C. Azimuth computations
- II. Total field station techniques

- A. Electronic Distance Measurement (EDM)
- B. Characteristics
- C. Accuracies
- D. EDM Operation

### III. GIS overview

- A. Components
- B. Sources
- C. Data Structures

### IV. Maps and plans

- A. Contours
- B. Topographic mapping
- C. Cross sections and profiles

### **Learning Activities**

Learning activities will require the student to exercise analytical and problem solving survey skills in his/her survey projects.

### **Grade Determination**

All assignments will be evaluated on quality and quantity of work completed. The student's final grade will be based upon his/her level of development in advanced survey skills.