

## **COURSE OUTLINE**

### **Introduction to Surveying**

#### **Course Description**

SR 104. Introduction to Surveying. 3 hours credit. Prerequisite: High school level geometry and trigonometry recommended. This course will enable the student to use basic surveying equipment, record notes, and use measurement and mapping techniques.

#### **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* (7th ed.). Columbus, OH: Prentice Hall.

#### **Supplementary Material**

Pencil and three-ring binder

#### **Learning Outcomes**

The intention is for the student to be able to:

1. Demonstrate use of basic survey math skills
2. Demonstrate use of survey fundamentals
3. Demonstrate the need for various types of surveys

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

Through the student involvement in this course, he/she will develop and document his/her achievement of the following primary PACT skill areas:

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

Secondary skills (developed but not documented):

Reading  
Listening  
Writing  
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 practical field project

## **Course Content**

- I. Themes - Key recurring concepts that run throughout this course:
  - A. Surveying fundamentals
- II. Issues - Key areas of conflict that must be understood in order to achieve the intended outcome:
  - A. Using survey equipment
  - B. Reading survey maps
  - C. Recording notes
- III. Concepts – Key concepts that must be understood to address the issues:
  - A. Setting up and using a surveyors transit
  - B. Setting up and using a surveyors level
  - C. Taking accurate and reliable measurements
  - D. Reading topographic maps
  - E. Recording accurate survey notes
- IV. Competencies - Actions that are essential to achieve the course outcomes:
  - A. Demonstrate proficiency in setting up survey equipment
  - B. Identify key components of the surveyors transit
  - C. Identify key components of the surveyors level
  - D. Demonstrate proficiency in taking measurements with a surveyors chain
  - E. Demonstrate ability to locate and retrieve recorded documents
  - F. Demonstrate ability to identify various types of deeds (e.g., senior, metes and bounds)
  - G. Demonstrate ability to identify various recorded documents (e.g., deeds and easements)
  - H. Demonstrate knowledge of survey disputes
  - I. Demonstrate how to solve basic survey math problems

## **Learning Units**

- I. Basics of surveying
  - A. Evolution of surveying
  - B. Field notes
  - C. Field management
- II. Distance measurement/Taping
  - A. Accuracy
  - B. Precision
- III. Types of Surveys
  - A. Land
  - B. Control
  - C. Topographic

- D. Traverse
- E. Boundary
  
- IV. Leveling
  - A. Definition of differential leveling
  - B. Reciprocal levels
  - C. Three-wire leveling
  - D. Level loop adjustment
  
- V. Angles and direction
  - A. Meridians
  - B. Horizontal Angles
  - C. Azimuths and bearings
  - D. Magnetic direction
  
- VI. Instrumentation
  - A. Instrumentation Geometry
  - B. Instrumentation adjustments
  
- VII. References
  - A. Geographic references
  - B. Grid references
  - C. Legal references
  - D. Vertical references

### **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 basic survey skills.