Effective: Fall 2017
Last Reviewed: 03/09/2017

Course Outline

BASIC COURSE INFORMATION

Course Number: ENGR 201
Course Title: PLANE SURVEYING
Lecture Hours Per Week: 2.00
Lab Hours Per Week: 3.00
Contact Hours Per Week: 5.00
Total Lecture Hours: 36.00
Total Lab Hours: 54.00
Total Contact Hours: 90.00
Credits: 3.00

Fall semester term is 18 weeks. Spring semester term is 17 weeks. The term length multiplier is 17.5 weeks. Curriculum is calculated off of 18 weeks.

Catalog Description:
Introduces the principles and practices of surveying, including the use of the engineer's tape, level, transit, and the use of an EDM (Electronic Distance Measurement). This equipment will be used to perform computations for horizontal and vertical distances, profiles, azimuths and bearings, traverse closures, topographic mapping, earthwork and land grading, and horizontal and vertical curves. Maps and land description also will be discussed.

Schedule Description:
Introduces the principles and practices of surveying, including the use of the engineer's tape, level, transit, and the use of an EDM (Electronic Distance Measurement). Prerequisite: MATH 229 or MATH 231. Transfer: CSU; UC. (Formerly ENGR201)

Prerequisites:

- MATH 231: TRIGONOMETRY WITH GEOMETRIC FOUNDATIONS
  or
- MATH 229: TRIGONOMETRY

Division: Engineering & Technology
Department: Engineering

Minimal Qualification Discipline Designation (MQDD):

Degree Applicability: Credit - Degree Applicable

Methods of Instruction:

- Lecture and/or discussion
- Laboratory/Studio/Activity
- Lecture/Lab

Grading Method:

- Letter Grade or P/NP

Repeatability:

Course Cap: 18

STUDENT LEARNING OUTCOMES

1. Understand the differences among (rectilinear) horizontal, vertical, and sloped distance measurements, as well as how to measure the different types of distances

2. Understand how to collect differential leveling data and use that data to determine elevations

3. Recognize the distinction between horizontal angles and vertical angles, and, in the case of the vertical angles, know the distinction between zenith and nadir angles, and how to measure them

4. conduct closed traverse computations, as well as correcting misclosures

5. Understand the parameters of, and considerations for, highway, street, and building surveys; be familiar with horizontal and vertical curves

COURSE CONTENT

Objectives:

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

1. Upon completion of this course, the student should be able to: 1. Record field notes in a clear, precise, and neat manner. 2. Measure horizontal and slope distances accurately with an engineer's tape; calculate and determine the tape correction due to changes in tension, changes in temperature, sag, and incorrect horizontal and vertical alignment; explain random errors. 3. Measure differences in elevation by means of the hand level and the engineer's level and the leveling rod, and if necessary be able to correct the error involved in the process: adjust the hand level and the Dumpy and Wye level. Wye level. 4. Demonstrate an understanding of the principles, operations, and adjust- ments of the transit; use the transit in the field to measure and lay off vertical and horizontal angles and extend lines and other fied operations. 5. Run and adjust a traverse and to calculate the area of a traverse. 6. Measure horizontal and vertical distance by means of stadia. 7. Develop a topographic map. 8. Perform calculations involving earthwork, land grading,

and horizontal and vertical curves.

Topics & Scope:

1. Standardization and Distance Measurement
   Leveling
   Building Layout
   Azimuths and Bearings
   Traverse and Stadia
   Maps and Land Description
   EDM Theory
   Latitudes and Departures
   Trilateration Concepts and Techniques
   Topographic Mapping
   Earthwork and Land Grading
   Horizontal and Vertical Curves (Obj)

Assignments:
2 hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent, per unit.

1. Daily study assignments in text and syllabus. Daily computational problem solving (homework) Engineering Field (lab) reports Preparation of a topographic map Keeping a field notebook Library has resources needed for assignment completion. Primarily college level. 2 hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent, per unit. Class participation and assignments require and develop critical thinking. 1. Identify cause-effect relationships 2. Recognize errors 3. Recognize mistakes 4. Apply known principles to new situations 5. Select appropriate operation 6. Analyze relationships 7. Analyze problems (Obj)

Class participation and assignments require and develop critical thinking.

Methods of Evaluation:

Texts, Readings, and Materials:

- **Textbooks**
  Kavanagh, Barry Surveying with Construction Applications Prentice Hall, Upper Saddle River, (2010). Rationale: Updated text for CoR in Curricunet

UC Transfer Course

University of California, Santa Barbara

CSU Transfer Course

California Polytechnic State University