**I. COURSE TITLE:** Surveying

 **COURSE NUMBER:**  2260 **CATALOG PREFIX:** ENDS

**II. PREREQUISITE(S):** MATH1120

**III. CREDIT HOURS:** 3 **LECTURE HOURS:** 2

 **LABORATORY HOURS:** 1 (3 contact) **OBSERVATION HOURS:** 0

**IV. COURSE DESCRIPTION:**

An introductory course to impart basic knowledge of surveying plus training in the use of traditional surveying equipment.

**V. ADOPTED TEXT(S):**

Surveying: Principles and Applications,

9th Edition

by Barry Kavanagh,

Prentice-Hall,

ISBN: 0-13-700940-2

**VI. COURSE OBJECTIVES:**

Explore the principles of surveying with tradition and modern survey equipment. Emphasis is placed on turning angles, taping, determining elevations, calculating areas, topography, mapping and route surveying.

Ten Student Exercises (Students will complete a written report for each):

Number: Brief Description:

1. Select surveying book for report. Examine equipment.
2. Estimate distance, pace it, tape it, determine accurate pace.
3. Estimate vertical distance, form survey party, check estimate using equipment and differential leveling.
4. Read example map. Verify a feature referencing magnetic compass directions and turning points.
5. Set up and level transit, take measurements, compare to EDM.
6. Lay out several 100’ stations. Measure and map an open survey.
7. Set up transit with stadia, use with graduated rods to measure distances.
8. Perform topographic survey. Part one: usually the North end of campus.
9. Perform topographic survey. Part two: complete a map of survey to scale.
10. Plan, map, then lay out a construction survey, checking parallel and squareness.

Essential Outcomes: Satisfied by SSCC

 Student exercise:

1. Demonstrate proper use of modern surveying

Equipment. 2,3,4,5,6,7,8 & 10

1. Use accurate measurement techniques to solve

construction related problems and produce

drawings from gathered information 2,3,4,5,6,7 & 10

1. Apply basic mathematical relationships and

their application the surveying process and

determine accuracy and precision. 2,3,4,5,6,7,8,9 & 10

**VII. COURSE METHODOLOGY:**

Course is a combination of in-class lecture and problem solving, using both graphical and mathematical methods. Some work will be done individually and other work will be done in teams or groups. Every individual will submit reports on each exercise.

**VIII. GRADING**

 Grading follows the policy in the college catalog.

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **90** | **–** | **100** |
| **B** | **80** | **–** | **89** |
| **C** | **70** | **–** | **79** |
| **D** | **60** | **–** | **69** |
| **F** | **0** | **–** | **59** |

**IX. COURSE OUTLINE:**

WEEK: MATERIAL: EXERCISES:

1. Introduction. Definitions, use and economy in surveying. The surveying method and equipment.
2. Field practice: surveying method and equipment.
3. Distance measurements, units, equipment. Grid reference. Location methods. Accuracy & precision. Pacing. Taping. GPS.
4. Field Practice: Distance Measurements. Test One.
5. Leveling. Differential leveling. Equipment and procedure. Signals. Benchmark leveling.
6. Field practice: Leveling.
7. Angles and directions. Reference directions. Meridians. Bearings and azimuths. Magnetic directions.
8. Field practice: Angles and Directions. Test Two.
9. Transits and theodolites. Circles and verniers. The telescope. Leveling setup, and adjustment. EDM.
10. Field practice – Transits. Book report due.
11. Transverse surveys. Open and closed. Balancing angles. Latitudes and departures. Stations.
12. Field practice: Topographic Surveys.
13. Topographic surveys. Scales and precision. Location. Stadia principles, examples, inclined precision.
14. Field practice: Topographic Surveys.
15. Electronic surveying measurement. Principles. EDM accuracies, operation. Total stations and GIS.

Survey drafting and computations. General overview. Maps and plans.

Plotting. Contours. Profiles. Computations. Land surveys.

Control surveys. Grid systems. GPS. Polaris. Construction surveys. Field practice.

1. Final Examination: Comprehensive, 2 hours. Maps and field notes due.

**X. OTHER REQUIRED TEXTS, SOFTWARE, AND MATERIALS:**

Field Exercise Book,

By: William C. Mason

Leitz Field Book

**XI. EVALUATION:**

Development of user hands-on skills, retention of general information, data handling skills. Increased speed and accuracy. Completion of assignments.

Note: Class attendance and participation is strongly recommended.

\*No late exercises accepted without advance approval, and will be penalized 10% per class. There will be no make-up tests.

Students guilty of academic misconduct receive a failing grade.

Please see your catalog and student handbook.

Assignments/Exercises 30% of final grade

Attendance 10% of final grade

Three tests 60% of final grade

**XII. SPECIFIC MANAGEMENT REQUIREMENTS:**

All assignments and tests must be turned in on time. Students may work on their own time to complete the assignments. Laboratory exercises are assigned for the student to complete during CAD lab hours, if the student has the CAD training.

Students will work in groups, at times, and then individually on certain other assignments. Some Examinations will include written and drawing components.

**XIII. OTHER INFORMATION:**

**FERPA:** Students need to understand that your work may be seen by others.

Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes.

Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**DISABILITIES:** Students with disabilities may contact the Disabilities Service Office, Central Campus, at 800-628-7722 or 937-393-3431.