West Virginia University
Department of Civil and Environmental Engineering
Course Syllabus

Course: **CE 200 - Land Surveying**

Semester: Fall 2010

Course Format
And Credit hours: 2 class periods, 75 minutes each
                           3 credit hours

Prerequisite: Math 128

Instructor: Dr. Darrell R. Dean, Jr., P.S., 617 Engineering Sciences Building
                           293-9929, Darrell.Dean@mail.wvu.edu or ddean@mix.wvu.edu

Schedule: TR   1100 – 1215

Location: G-3 ESB

Office Hours: By appointment

Course Objective: Provide an introduction to land surveying measurements and calculations
                           for natural resource managers and landscape designers for the purpose of
                           carrying out basic mapping projects and simple construction layouts.

Expected Learning
Outcomes: Upon successful completion of this course the students are expected to
                           demonstrate the ability to:

Error Theory -

       Describe two types of surveying measurement errors and three different
       categorical sources for these errors.

       List three properties of random errors and explain how random errors propagate
       or how they influence the end results of measured or calculated quantities.

       Describe the meaning of accuracy, precision, and resolution.

Leveling -

       Explain the theory of differential leveling by utilizing two equations and a labeled
       profile view showing a level, a leveling rod, the ground surface, the elevation

datum, and other required variables.

Conduct leveling operations by using a level to acquire backsights, foresights, intermediate foresights, and perform calculations to determine elevations and make the checks to verify and quantify the results.

Calculate differences in elevation using backsights, foresights, elevations, and slope distances and slope angles.

Describe the concept of stationing as used to define the location of points along a linear feature such as along a center line for profile leveling.

Perform a simple level loop adjustment.

Angle and Directions-

Operate a total station to obtain angles-to-the right, vertical angles, slope distances, horizontal distances, and vertical distances.

Given the bearing of one side of a traverse and any combination of interior angles, exterior angles, deflection angles or angles-to-the-right at the vertexes of a traverse, calculate the bearings and/or azimuths of all other sides of the traverse; or, given the bearings or azimuths of all sides of a traverse, calculate any of the above mentioned angles at each vertex.

Explain the difference between a zenith angle and an angle of elevation or an angle of depression.

Distance Measurements-

Calculate horizontal distance given slope distance and slope angle.

Describe how precision is expressed for distance measurements.

Explain these methods for expressing slope gradient: slope angle, percent slope, and the topo scale.

List four units used in distance measurement and convert from one unit to the other.

Traverse Calculations-

Describe two traversing methods and three types of traverses.

Perform traverse calculations for angle adjustment, bearing or azimuth, latitude, departure, linear error of closure, relative error of closure, compass-rule

corrections, and coordinates.

Calculate the direction and distance between two points when the coordinates of the two points are known.

Calculate the area of a closed traverse.

Topographic Mapping-

Describe four field methods for collecting topographic and planimetric data.

Describe the office procedures for creating a topographic map.

Describe how intermediate and index contours are selected.

Describe the characteristics of index contours as shown on a map.

Create a topographic map showing the minimum required map labels and elements using profile and cross-section data.

Create a topographic map showing the minimum required map labels and elements using data from the controlling point method of data collection.

Construction Surveying -

Explain how baselines and batter boards are used during the construction layout for constructed facilities or landscape designs.

Explain how to set a grade stake or a grade elevation from a temporary benchmark (TMB).

Perform calculations for slope stake positions in cut and fill situations.

Calculate earthwork volumes.

Required Text: *Surveying Fundamentals and Practices*, 6th Edition, by Jerry Nathanson, Michael T. Lanzafama, Philip Kissam, Prentice Hall, 2011, New Jersey. ISBN: 0-13-500037-8

Notes: You are encouraged to download notes from eCampus.

Grading: 2 Exams (@ 20 % each)   40 %
                    Assignments   35%
                    Final Exam   25 %
                                              100 %

Grade Assignment:	100 – 90 A
	89 – 80 B
	79 – 70 C
	69 – 60 D
	59 – 0 F

Grading Policy: The Replacement Rule may be used one time and is defined as follows: A missed exam or the lowest score on either **Exam 1** or **Exam 2** may be replaced with the average score of any two other exams—i.e., either Exam 1 or Exam 2 and the Final Exam. However, before applying the rule to the lowest score on Exam 1 or Exam 2, you must achieve a grade of at least 69% on the Final Exam. The replace rule <u>cannot</u> be used to replace the **Final Exam** score. The replacement rule applies in <u>all</u> cases of missed exams.

    Assignments are due at the <u>beginning of the period</u> on the due date. Some lab assignments are due at the end of the lab. Late assignments or missed lab assignments will only be accepted on a case-by-case basis for circumstances beyond your control. Lab participation and timely submission of assignments are encouraged.

HW Assignments: Homework assignments will be given approximately every week. Most assignments will be worth 50 points.

Attendance Policy: Attendance is not counted in the grading system, but <u>is required</u> to receive a grade for outside surveying measurement assignments. See Grading Policy above concerning missed labs. Attendance is recommended and encouraged.

    "WVU recognizes the diversity of students, many of whom must be absent from class to participate in religious observances. Students must notify their instructors by the end of the third class meeting regarding religious observances that will affect their attendance. Further, students must abide by the attendance policy of their instructors as stated on their syllabi. Faculty will make reasonable accommodation for tests or field trips that a student misses as a result of a religious observance." See missed exam policy under Grading Policy.

Social Justice
Statement: "West Virginia is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability,

veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class. Please advise me and make appropriate arrangement with Disability Services (293-6700)."

Academic Integrity/
Honesty Policy: West Virginia University expects that every member of its academic community shares the historic and traditional commitment to honesty, integrity, and the search for truth. Students and faculty should act to prevent opportunities for academic dishonesty to occur, and act in such a manner to discourage any type of academic dishonesty. Academic dishonesty includes plagiarism; cheating and dishonest practices in connection with examinations, papers, and projects; and forgery, misrepresentation, and fraud. Complete policy statements and definitions on academic integrity/dishonesty can be accessed at:

http://studentlife.wvu.edu/studentconductcode.html

and
http://provost.wvu.edu/academic_affairs/undergraduate/university_policies

Calculator: Bring a scientific calculator to each class period.

Supplies: You will be required to have a jump drive to hold files for your computer mapping projects. You are also requested to purchase a 360° protractor to assist in learning about directions and angles.

Proposed Course Schedule: Fall 2010 – CE 200

Week	Starting	Topic: Reading Assignment
1	8/23/10	Intro. and Error Theory: Chaps. 1, 2, & 3 & Appendix D
2	8/30/10	Leveling: Chap. 5
3	9/06/10	Leveling: Chap. 5 cont.
4	9/13/10	Leveling: Chap. 5 cont.
5	9/20/10	Angles and Directions: Chap. 6
6	9/27/10	Angles and Directions: Chap. 6 cont. **EXAM 1 (9/30/10)**
7	10/04/10	Distance Measuring: Chap. 4
8	10/11/10	Traverse Calculations: Chap. 7
9	10/18/10	Traverse Calculations: Chap. 7 cont.
10	10/25/10	Traverse Calculations: Chap. 7 cont. **EXAM 2 (10/28/10)**
11	11/01/10	Topographic Mapping: Chap. 9
12	11/08/10	Topographic Mapping: Chap. 9 cont.
13	11/15/10	Topographic Mapping: Chap. 9 cont.
14	11/22/10	**THANKSGIVING RECESS**
15	11/29/10	Construction Surveying: Chap. 10-7(only) & Chap. 11
16	12/06/10	Construction Surveying: Chap. 10-7(only) & Chap. 11 Review
17	12/13/10	**FINAL (Mon., Dec. 13, 2010: 1500 – 1700)**

Note: Schedule may change depending on class interest and weather.