

SURV 55 "GPS for Civil, Surveying & Land Development"

Course Outline for Spring 2005

Section Web Page: <http://online.santarosa.edu/section/?3407>

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Textbook and Required Supplies:

- **Introduction to GPS, the global positioning system**, Ahmed El-Rabbany, Artech House Publishers
- **Elementary Surveying, An introduction to Geomatics**, Wolf / Ghilani, Prentice Hall Publishing Inc., 10th Edition, or similar plane surveying textbook.
- Scientific-Engineering calculator.

Course Goals and Objectives:

This is an introductory 8-week course that will cover the basic principles, applications, skills and equipment used in control and astronomic surveying. Primarily, the student will learn to operate global positioning system equipment for navigation and survey grade location. The student will use conventional electronic surveying instruments (total stations) as well as the GPS equipment for control surveys, navigation and mapping. The course will cover state plane and geographic coordinate systems and the computations associated with these systems, different map projections and datums, and post processing data. There is a field lab associated with each class.

The student will:

- Identify types of control surveys and their applications in civil engineering and surveying.
- Use appropriate field procedures for horizontal and vertical control of surveys.
- Define and give illustrative examples of map projections and the datums associated with them.
- Determine the geographic coordinates and plane coordinates of points within the two California Coordinate Systems.
- Determine the direction of a line by Astronomic Observation.
- Demonstrate the proper use of electronic surveying equipment such as total stations global positioning systems.
- Post-process data obtained using electronic surveying equipment.

Attendance:

- Attendance is required for both lab and lecture hours. Class begins at ten minutes after the hour and ends on the hour. You are responsible for your attendance. Excused absence only by contacting instructor prior to beginning of class. No Exceptions!

Assignments:

- All assignments are to be done per instructions and due at the specified time and date.
- Late assignments **WILL NOT** be accepted without prior approval of the instructor. An appropriate deduction will be made to the grade of the late assignment.
- All assignments are to be done on the sheets provided. If sheets are not provided, 8½" x 11" paper shall be used.
- All written assignments, ie., reports, essays, etc., shall be typed.
- Assignments will have the students name, date, assignment # and class #, on the first page of the assignment. Multiple sheets will be stapled prior to turning in.
- REMEMBER that assignments are your responsibility. Failure to observe these conditions will result in papers being returned without credit.

Tests:

- There will be exams given on specific areas covered throughout the semester. Sufficient notice will be given prior to the exam date and a review of the exam will be conducted during the previous class lecture.
- **No make up exams will be given!**
- The final examination will be given on the last class meeting, Monday, March 14, 2005, from 12:00 –

1:30 p.m. The final exam is required. Failure to take this exam will result in a grade of "F" for the course.

Project and Field Exercises:

- All projects and field exercises (labs) are to be completed as per instructions and are due on the specified date and time. Late labs **WILL NOT** be accepted.
- **No make up labs will be given!**
- Attendance is mandatory.

Grading:

- Your grade will be based on the total points accumulated with respect to top score total points. The sum of the points in each category is multiplied by the following percentages to arrive at the total points accumulated and the top score total points.

$$\begin{array}{r} \text{All HOMEWORK points multiplied by 25\%} \\ \text{All LAB points multiplied by 40\%} \\ + \text{All EXAM points multiplied by 35\%} \\ \hline \text{Total Accumulated Points (100\%)} \end{array}$$

- Total points are calculated as noted above and final grades based on the following percentages.

$$\text{YOUR TOTAL POINTS} \div \text{TOP SCORE TOTAL POINTS} = \text{GRADE \%}$$

90 - 100% = A
80 - 89% = B
70 - 79% = C
60 - 69% = D
Below 60% = F

- An "I" (incomplete) will only be given with the prior approval of the instructor.

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The object of listing reading assignments is to help you plan your personal schedules. You should be familiar with the reading assignment *prior* to the class lecture. You should allow yourself a minimum of four hours a week to complete the required reading and homework assignments. Every effort will be made to stay on schedule. However, the instructor, may find it necessary to make appropriate changes due to inclement weather or to meet the learning objectives for the entire class. See **Course Syllabus** for guidelines, specific information regarding course objectives, attendance, supplies, homework, lab assignments, exams and grading.

TENTATIVE SEMESTER TOPICS OUTLINE

Topic	Description	Chapter	Assignment
1	Introduction to Global Positioning Systems	1 & 2	
2	Datums, Coordinate Systems and Map Projections	4 Instructor Handouts	
3	GPS Positioning Modes	5 Instructor Handouts	
4	GPS Receivers	Instructor Handouts	
5	Navigating with GPS	Instructor Handouts	
6	Mission Planning	3	
7	Static Observations	10 Instructor Handouts	
8	Post-Processing Data	7 & 8 Instructor Handouts	
9	RTK Observations	10 Instructor Handouts	