
ERE 371 – SURVEYING FOR ENGINEERS COURSE SYLLABUS

INSTRUCTOR

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TEXTS AND EQUIPMENT

Required:

Elementary Surveying by Ghilani and Wolf (Twelfth edition): available at Orange Book Store, Marshall Square Mall (also on reserve in Moon Library)

A scientific calculator

A pencil with hard (3H or harder) and sharp lead but no eraser

Recommended:

GPS for Land Surveyors by Van Sickle (Third edition): on reserve in Moon Library

COURSE PURPOSE

Many programs at ESF aim at training students in designing solutions to problems associated with managing and developing land resources. A basic tenet of this training is an ability to locate and quantify the resource(s) being managed or problem(s) being solved. In addition professionals involved with the design and construction of facilities must acquire knowledge of construction surveying principles and practices. ERE 371 introduces surveying for these and other tasks associated with engineering or construction management practice.

COURSE OBJECTIVES

At the conclusion of this course, the student will be able to:

- Use the principles and procedures of plane surveying for data collection, mapping, and construction layout;
- Analyze and reduce survey field measurements to produce a topographic map;
- Assess the accuracy and precision of field measurements, evaluate the sources of systematic and random errors in those measurements, and determine the suitability for calculating derived quantities;
- Perform, as a member of a team, many of the procedures of surveying field data collection (including the use of many types of equipment), professional documentation and communication, surveying computations and adjustments, and surveying data representation.

Through the course, students will gain practice in:

- Performing surveying field procedures as a member of a team;
- Preparing professional documentation and graphical communications.

PROGRAM OUTCOMES

Within the context of the course purpose and objectives presented above, this course will contribute to graduates achieving the following specific outcomes:

- Competent to perform in an engineering environment
 - Participate in a semester-long project that is presented in a professional context
- Have sufficient backgrounds/tools to function effectively
 - Demonstrate mathematical preparation for problem solving
 - Exhibit skills in computation and communication
 - Function in situations with higher expectations for personal responsibility
- Communicate their ideas and expectations effectively
 - Learn and master effective recording of field data collection results and methods
 - Demonstrate graphical communication by producing a professionally acceptable, accurate and effective topographic map
 - Practice professional communication by composing transmittal and project conclusion memorandums
- Exhibit attributes of a competent professional
 - Knowledge: understand and apply basic mathematical and spatial principles to creatively solve problems
 - Skills: utilize analytical and computation approaches; become accomplished users of a variety of data collection tools
 - Attitude: professional ethics, documentation, self-discipline, and perseverance
- Function effectively in a multidisciplinary team/environment.
 - Work with two or three other students to progress and conclude a semester-long project

RESPONSIBILITIES AND ATTITUDES

In order to be successful, everybody involved in this course must assume certain responsibilities. The professor's responsibilities include managing the overall course conduct, preparing and presenting instructional activities, preparing laboratory exercises, writing and grading exams, and supervising the teaching assistant(s). The TAs are responsible for conducting and grading lab exercises, helping grade exams, helping to prepare materials, and providing help during class times and office hours. The student's responsibilities are to learn the material and apply it to their profession and career. This responsibility includes attending class, completing assigned work, preparing for exams, and doing whatever is necessary for truly understanding and retaining the subject. Academic dishonesty is unacceptable evidence of character and will be dealt with severely.

ASSIGNMENTS

Readings and homework problems assigned in lecture are important. There will be no formal grading of these assignments but completing assigned homework is highly recommended as many exam problems will be similar to the homework problems. The homework problems and associated solutions will be available through Blackboard.

COMPUTER USE

Word processing and spreadsheet software packages are considered basic tools in modern life. These types of programs should be used for written and graphic communication and many types of quantitative analyses. E-mail will be used frequently for communicating outside class times. All students have access to an e-mail account through the Syracuse University system. Computer clusters at ESF and at SU provide access to the Internet for those who do not have home access.

GRADING

Exam 1	20 %
Exam 2	20 %
Exam 3	20 %
In class exercises	5 %
Field work/Lab submissions	20 %
Final map	12 %
Final map computations	<u>3 %</u>
	100%

A final exam will be offered during the scheduled final exam period. This final exam will cover material from the whole course. If you take all four exams, only the three highest exam grades will count towards your course grade. You must take the final exam if you miss one of the regularly scheduled exams. The field work and lab book grades are largely based on proper note taking procedures, neatness, and organization.

The numerical scores you earn on class assignments will average to a final numerical score for the course. Letter grades will be assigned based on the scale shown below. The grade cutoffs may be adjusted by a point when actually assigning final grades at the end of the semester.

Letter Grade	Range of Numerical Grade
A	90 and above
A-	87 to just less than 90
B+	84 to just less than 87
B	80 to just less than 84
B-	77 to just less than 80
C+	74 to just less than 77
C	70 to just less than 74
C-	67 to just less than 70
D	60 to just less than 67
F	less than 60

SOURCES OF SUPPORT AND CLASS ABSENCE

If you experience academic or personal difficulties that affect your studies or life, there are many sources of support on campus. There is a website that serves to answer many student questions: <http://www.esf.edu/students/success>. In addition, the ESF Office of Student Life, 110 Bray Hall (470-6660) will provide academic support, career guidance, personal counseling, or direct you to the proper source of help. If you encounter a situation beyond your control in which you will be missing three or more days of classes, you can contact the Office of Student Life and they will contact all your instructors for you. Supportive documentation may be required.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

If you have an identified disability and will need accommodations, you should contact the Office of Student Life in 110 Bray Hall. Councilors will discuss the ESF process and work with you to access supportive services. If you have a learning disability, the College requires you to provide supportive documentation and will develop an approved accommodation sheet for you. Accommodations cannot be provided until the accommodation sheet is established and we meet to discuss its applicability to this course. Accommodations cannot be established retroactively.

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LECTURE SCHEDULE – FALL 2010

DATE	LECTURE TOPIC	READINGS
31Aug	Introduction to Surveying	Ch 1; Ch 2: sec 6-11; Ch 3: sec 1-7
2 Sep	Horizontal Distance Measurement	Ch 6: sec 1-16
7 Sep	Horizontal Distance and Angle Measurement	Ch 6: sec 17-24; Ch 7: sec 1-9
9 Sep	Horizontal Measurement	Ch 7: sec 10-16; Ch 8: sec 1-5, 20, 22
14 Sep	Surveying as a Measurement Science	Ch 2: sec 1-5; Ch 3: sec 1-14
16 Sep	Surveying as a Measurement Science	Ch 3: sec 15-21
21 Sep	Position Determination	Ch 19: sec 1, 2, 6-10
23 Sep	Coordinate Systems	Ch 20: sec 1-5, 12
28 Sep	Mapping	Ch 17: 1-6, 9; Ch 18: 1-12, 16-17
30 Sep	Traversing	Ch 9: sec 1-8, 10, 11; Ch 10 sec 1-6
5 Oct	** EXAM 1 – Through Mapping **	
7 Oct	Traverse Adjustment	Ch 10: sec 7-8, 10-11, 16-17; Ch 16: Sec 1-3
12 Oct	Coordinate Geometry and Area Calculation	Ch 11: sec 1-4; Ch 12: sec 1-5, 9-11
14 Oct	Measurement of Vertical Distance	Ch 4: sec 1-14, 15.5 ; Ch 19: sec 6.4, 6.5
19 Oct	Measurement of Vertical Distance	Ch 5: sec 1-6, 9-14
21 Oct	Construction Layout; Introduction To Horiz. Curves	Ch 23; Ch 24: sec 1-2
26 Oct	Horizontal Circular Curves	Ch 24: sec 3-8, 21-22
28 Oct	Vertical Curves	Ch 25: 1-5, 12-14
2 Nov	Earthwork	Ch 26: 1-9, 13, 14
4 Nov	** EXAM 2 – Through Vertical Curves **	
9 Nov	Overview of GPS	Ch 13: sec 1-4
11 Nov	Positioning and GPS errors	Ch 13: sec 5-6
16 Nov	GPS enhancement	Ch 13: sec 7-11
18 Nov	<i>Mapping grade GPS demonstration</i>	
23 Nov	Methods and Project Planning	Ch 14: sec 1-5
25 Nov	NO CLASS – THANKSGIVING RECESS	
30 Nov	Errors in GPS; GPS equipment	Ch 14: sec 6-8
2 Dec	<i>Guest Lecture</i>	Ch 15: sec 9
7 Dec	** EXAM 3 – Through GPS **	
9 Dec	Review	

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LAB SCHEDULE – FALL 2010

MONDAY LAB SCHEDULE		TUESDAY LAB SCHEDULE		THURSDAY LAB SCHEDULE	
DATES	LABORATORY EXERCISE	DATES	LABORATORY EXERCISE	DATES	LABORATORY EXERCISE
30 Aug	Introduction to Lab & Taping	31 Aug	Introduction to Lab & Taping	2 Sept	Introduction to Lab & Taping
6 Sept	LABOR DAY – NO LAB	7 Sept	GPS Collection & Station Tie-ins	9 Sept	GPS Collection & Station Tie-ins
13 Sept	GPS Collection & Station Tie-ins	14 Sept	Horizontal Measurement	16 Sept	Horizontal Measurement
20 Sept	Horizontal Measurement	21 Sept	Horizontal Measurement	23 Sept	Horizontal Measurement
27 Sept	Horizontal Measurement	28 Sept	Map Data Collection	30 Sept	Map Data Collection
4 Oct	Map Data Collection	5 Oct	Map Data Collection	7 Oct	Map Data Collection
11 Oct	Map Data Collection	12 Oct	Traverse Comp's & Mapping	14 Oct	Traverse Comp's & Mapping
18 Oct	Traverse Comp's & Mapping	19 Oct	Introduction to Leveling	21 Oct	Introduction to Leveling
25 Oct	Introduction to Leveling	26 Oct	Leveling of Traverse	28 Oct	Leveling of Traverse
1 Nov	Leveling of Traverse	2 Nov	Profile Leveling	4 Nov	Profile Leveling
8 Nov	Profile Leveling	9 Nov	Horizontal Curve Stakeout	11 Nov	Horizontal Curve Stakeout
15 Nov	Horizontal Curve Stakeout	16 Nov	Mapping and Map Data Collection	18 Nov	Mapping and Map Data Collection
22 Nov	Mapping and Map Data Collection	23 Nov	Mapping	25 Nov	THANKSGIVING – NO LAB
29 Nov	Mapping	30 Nov	Mapping	2 Dec	Mapping
6 Dec	Mapping	7 Dec	Mapping	9 Dec	Mapping

PRELIMINARY MAP: Due at the start of lab on 1 Nov (M) / 26 Oct (Tu) / 28 Oct (Th)

FINAL MAP: Due by 4 pm on Monday 13 December