ERE 566 – INTRODUCTION TO GLOBAL POSITIONING SYSTEMS
COURSE SYLLABUS – FALL 2015

INSTRUCTOR

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CLASS MEETING TIMES

Lecture: Tuesday/Thursday 9:30–10:50 AM

RECOMMENDED TEXTS

GPS for Land Surveyors by Van Sickle (Third edition): available in Moon Library
Elementary Surveying by Ghilani and Wolf (Thirteenth edition): available in Moon Library

COURSE DESCRIPTION

An introduction to the theory and practice of performing global positioning system (GPS) measurements. Comparison of accuracy potential for different GPS equipment and techniques. Exploration of error sources that reduce the accuracy of GPS measurements. Collection of GPS data.

COURSE LEARNING OUTCOMES

Global positioning systems (GPS) provide a means to collect location information for a variety of applications. This course provides an introduction to the theory and practice of performing GPS measurements. At the conclusion of this course, the student will be able to:

- Describe the fundamentals of GPS measurements;
- Compare the potential accuracy of different GPS equipment and techniques;
- Explain the sources of error that contribute to reduced accuracy in GPS;
- Operate a mapping grade GPS unit.

COURSE STRUCTURE

The lectures for this course are taught concurrently with those for ERE 371 Surveying for Engineers during approximately the last third of the semester. While the lecture content will be the same for the two courses, there are distinct differences. In particular, this course does not include any laboratory exercises, so the single exam, additional project, and in-class and homework exercises contribute more substantially to the grade.

GRADING

As summarized below, assessment in this class is based on four components: one exam, one project, in-class exercises and involvement, and several homework problem sets.

Component	Grade contribution
Exam	45 %
Project	10 %
In-class exercises/class participation	15 %
Homework problems	30 %

The numerical scores you earn 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.

Letter Grade	Range of Numerical Grade
A	93 and above
A-	90 to just less than 93
B+	87 to just less than 90
B	84 to just less than 87
B-	80 to just less than 84
C+	77 to just less than 80
C	74 to just less than 77
C-	70 to just less than 74
F	Less than 70

LECTURE SCHEDULE

Date	Topic	Readings from Ghilani and Wolf
10 Nov	Overview of GPS	Ch 13: sec 1-4
12 Nov	Positioning and GPS errors	Ch 13: sec 5-6; Ch 14: sec 6-7
17 Nov	*GPS demonstration*	
19 Nov	GPS enhancement and GNSS	Ch 13: sec 7-11
24/26 Nov	***NO CLASS – THANKSGIVING***	
1 Dec	GPS Techniques and Project Planning	Ch 14: sec 1-7, Ch 15: sec 10
3 Dec	*Guest Lecture*	
8 Dec	**In-Class Exam**	
10 Dec	Review	

HOMEWORK PROBLEMS

A set of homework problems will be available through the ERE 566 Blackboard site. These homework problems are intended to support understanding of each of the topics presented in the lectures. The due dates for each exercise are listed below. The assignments will be submitted electronically via Blackboard. All submissions should be professionally prepared. Solutions to the problem sets will be posted on Blackboard after the due date.

Set	Topic	Due Date
1	GPS: Overview and Reference Systems	17 Nov
2	Position Determination and Errors	1 Dec
3	GPS: Augmentation Systems and Project Planning	5 Dec

PROJECT

Students in ERE 566 will gain familiarity with the use of a mapping grade GPS unit—the Trimble GeoExplorer GeoXH—through completion of a short independent project. This exercise will involve collecting point and line data for several features on campus, downloading and differentially correcting the data, plotting the output, and providing a report that synthesizes the exercise. The project assignment is available on Blackboard. Students should arrange to meet with Paul Szemkow (pszemkow@esf.edu) from November 11–13 to gain access to a receiver. You should bring the receiver to class on November 17 having tested the equipment and be able to collect data. The data collection and post-processing for the project must be completed no later than December 4. The project report will be due on December 11. Further details about the project will be provided in a separate handout.

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, writing and grading exams, and supervising the teaching assistant(s). The TA is responsible for helping grade exams and providing assistance during class times and office hours. The student's responsibilities are to learn the material in order to 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.

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 full-time 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.

ATTENDANCE POLICY:

Participation in lectures is essential to success in this course. As shown on the grading schedule above, in-class exercises count toward the overall grade and inherently track attendance.

ACADEMIC DISHONESTY

Academic dishonesty is a breach of trust between a student, one's fellow students, or the instructor(s). By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct (http://www.esf.edu/students/handbook/StudentHB.05.pdf), in particular academic dishonesty includes but is not limited to plagiarism and cheating, and other forms of academic misconduct. The Academic Integrity Handbook contains further information and guidance (http://www.esf.edu/students/integrity/). Infractions of the academic integrity code may lead to academic penalties as per the ESF Grading Policy (http://www.esf.edu/provost/policies/documents/GradingPolicy.11.12.2013.pdf).

SOURCES OF SUPPORT AND CLASS ABSENCE:

If you experience academic or personal difficulties that affect your studies or life, there are people and resources that will help you. 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 3 or more days of classes, you should contact the Office of Student Life and they will get in touch with all your instructors for you. Supportive documentation may be required.

ACCOMMODATIONS FOR STUDENTS WITH LEARNING AND PHYSICAL DISABILITIES:

SUNY-ESF works with the Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations. Students can contact ODS at 804 University Avenue- Room 309, 315-443-4498 to schedule an appointment and discuss their needs and the process for requesting accommodations. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall, 315-470-6660 for assistance with the process. To learn more about ODS, visit http://disabilityservices.syr.edu. Authorized accommodation forms must be in the instructor's possession one week prior to any anticipated accommodation. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

RELIGIOUS OBSERVANCE:

ESF recognizes the diversity of faiths represented among the campus community and protects the rights of students to observe religious holy days according to their tradition. Students will be provided an opportunity to make up any exam or work requirements that may be missed due to a religious observance provided they give the instructor reasonable advance notification.