Department of Civil Environmental and Geomatics Engineering
Florida Atlantic University
Course Syllabus

1. Course title/number, number of credit hours	
Satellite Positioning Lab (SUR4531L)	1 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisite: SUR3530; Corequisite: SUR4531	
3. Course logistics	
Semester: Fall 2013 This is a weekend day lab Lab time: Sunday, 8 AM – 5 PM	
4. Instructor contact information	
Dr. Mustafa Berber, P. Eng. Civil, Environmental and Geomatics Engineering College of Engineering and Computer Science Florida Atlantic University 777 Glades Road, Building 36, Room 213 Boca Raton, FL, 33431 Phone: (561) 297 3090 Fax: (561) 297 0493 E-mail: mberber@fau.edu	
5. Course description	
Utilization of GPS for data collection and post-processing; methods for adjusting networks. Practical applications of GPS technology for land survey projects utilizing actual GPS survey data from U.S. government Cadastral Survey in a wide variety of conditions and applications. Topics include fundamentals of GPS, geodesy, project planning, survey techniques, field procedures, data processing and evaluation, network adjustment, and an overview of real-time.	
6. Course objectives/student learning outcomes/program outcomes	
Course objectives	To provide a fundamental level of understanding of satellite positioning, with emphasis on the Global Positioning System (GPS).
Student learning outcomes & relationship to ABET a-k objectives	1. Comprehend the basics of satellite positioning (a) 2. Understand GPS positioning techniques (a, b, e, k) 3. Understand the errors and biases associated with GPS measurements and how to model them (a, b, e, k) 4. Be able to collect data using GPS, process the data and produce results (a, b, e, k) 5. Have a better grasp of other satellite positioning systems (a)

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Relationship to program outcomes	**Outcome 1**: An understanding of professional and ethical responsibility (High) **Outcome 2**: A working knowledge of fundamentals, engineering tools, and experimental methodologies (High) **Outcome 3**: An understanding of the social, economic, and political contexts in which engineers must function (Medium) **Outcome 4**: An ability to plan and execute an engineering design to meet an identified need (High) **Outcome 5**: An ability to function on multi-disciplinary teams (Medium) **Outcome 6**: An ability to communicate effectively (Medium) **Outcome 7**: Graduates will have proficiency in the following areas of civil engineering: (i) structural engineering, (ii) transportation engineering, (iii) geotechnical engineering, (iv) water resources, and (v) environmental engineering (High) **Outcome 8**: Graduates will have an adequate appreciation for the role of civil engineering in infrastructure planning and sustainability including safety, risk assessment, and hazard mitigation (Medium) **Outcome 9**: Graduates will be successful in finding professional employment and/or pursuing further academic studies (High)

7. Course evaluation method

Course attendance: 5%
Field notes: 5%
Lab reports*: 50%
Final exam: 40%

* As can be seen with the contribution of lab reports to overall grade, these reports will be the integral part of this course. As such, reports will include all the measurements, methods, analysis, results, drawings etc. for all the scheduled lab activities.

8. Course grading scale

To succeed in this class:
Fully completed field book must be handed in.
Fully completed lab reports (all of them) must be handed in.
Final exam must be taken.

9. Policy on makeup tests, late work, and incompletes

Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements.

Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.

10. Special course requirements

Unless there is a legitimate reason, full attendance to the labs is required. For this purpose an attendee list will be kept. To claim presence you must be in lab from the beginning to the end. Absence from labs must be documented.

Lab report for each activity must be finalized and handed in on the due date. Per day 10% penalty will be enforced for all late submissions.

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11. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

12. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

13. Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

14. Required texts/reading

Van Sickle, J., (2008). "GPS for Land Surveyors", 3rd edition, CRC Press, New York.

15. Supplementary/recommended readings

Hoffmann-Wellenhof, B., H. Lichtenegger and J. Collins (2001). GPS: Theory and Practice, Fifth edition, Springer Verlag; Wien, New York.
Leick, A (2004). GPS Satellite Surveying, third edition, John Wiley & Sons Inc., New Jersey.

16. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Week 1: Introduction, What is GNSS?
Week 2: Extraterrestrial positioning techniques
Week 3: Overview of GPS
Week 4: GPS basic concepts
Week 5: Planning GPS surveys
Week 6: GPS positioning techniques
Week 7: Concepts of positioning from space
Week 8: Satellite Datums
Week 9: GPS standard formats
Week 10: Troposphere and Ionosphere
Week 11: Observation equations
Week 12: Biases and errors
Week 13: Online GPS processing services
Week 14: Other satellite navigation systems
Week 15: Applications of GPS, Course review