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| **1. Course title/number, number of credit hours** | | |
| Geodesy and Geodetic Positioning (SUR 4530) | | 2 credit hours |
| **2. Course prerequisites, corequisites, and where the course fits in the program of study** | | |
| Prerequisite: SUR3141 and SUR3141L both with minimum grade of "C"  Corequisite: SUR 4530L | | |
| **3. Course logistics** | | |
| *Semester*: Fall 2018  This is a live, on-line course  Class time: Thursday, FL 401 7:10PM – 9:00PM  *Lab time: Sunday, 8AM – 5PM, HA 103 Jupiter campus*  Office hours: WR 3:00-5:00PM | | |
| **4. Instructor contact information** | | |
| Dr. Sudhagar Nagarajan  Building: 36, Room: 222  Boca Raton, FL  Phone: (561) 297 3104  E-mail: snagarajan@fau.edu | | |
| **5. Course description** | | |
| Concepts of geodesy, ellipsoidal geometry, geodetic coordinates, gravity, datums, satellite orbits, and practical applications of GPS data collection, post-processing, and adjusting networks. | | |
| **6. Course objectives/student learning outcomes/program outcomes** | | | |
| *Course objectives* | To provide a fundamental level of understanding of geodesy, satellite positioning, with emphasis on the Global Positioning System (GPS). | | |
| *Course outcomes*  *& relationship to ABET a-k student03 outcomes* | 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 (a, b, e, k)  4. Be able to collect data using GPS, process the data and produce maps (a, b, e, k) | | |
| *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** | | | |
| Lab reports: 25%  Midterm exam: 20%  Homeworks: 20%  Final exam: 35%  Note: The minimum grade required to pass the course is C. | | | |
| **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.  If you are late to the lab exercise for upto 1 hour, 25% of your lab grade points will be taken off. If you are late by an hour or more, no grades will be given for the lab exercise.  Lab report for each activity must be finalized and handed in by the due date.  Late submissions will not be graded unless it is approved by the instructor. | | | |
| **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 Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 131 (954-236-1222); or in Jupiter, SR 110 (561-799-8585) —and follow all SAS procedures. | | | |
| **13. Honor code policy** | | | |
| 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 www.fau.edu/regulations/chapter4/4.001\_Honor\_Code.pdf. | | | |
| **14. Required texts/reading** | | | |
| Van Sickle, J., (2015). “GPS for Land Surveyors”, 4th 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: GPS signal structure  Week 3: GPS Biases and Solutions  Week 4:GPS Biases and Solutions  Week 5: GPS framework  Week 6: Receivers and Methods  Week 7: Geodetic Datums  Week 8: Mid-term  Week 9: State Plane Coordinates  Week 10: GPS Surveying Techniques  Week 11: Observing and Processing  Week 12: GPS Modernization  Week 13: Online GPS processing services  Week 14: Other satellite navigation systems  Week 15: Applications of GPS, Course review  Lab Exercises  08/26/17-Data collection, downloading and processing  09/09/17-Static Survey  09/30/17-Import control into the project area  10/21/17-Real Time Kinematic Survey  11/19/17-Other GPS surveying techniques | | | |