

SUR 223 – Geodesy I Spring 2020

A. COURSE INFORMATION

Course number/section: SUR 211.001

Class meeting time: Lecture: M/W (9am to 9:50am); Lab: F (12pm to 4pm)

Class location: Lecture: Online Only

Course Website:

B. INSTRUCTOR INFORMATION

Instructor: C.A. “Tony” Nettleman, III

Office location: Online Only

Office hours: TBA

Telephone: TBA

E-mail: TBA

Appointments: TBA or by appointment

Please be aware that e-mails are typically returned within 24 hours and I will be traveling throughout the semester (dates will be posted shortly before each trip). For immediate assistance, please call my cell phone.

C. COURSE DESCRIPTION

Catalog Course Description

History of geodetic measurement. Description of the geodetic model of the earth. Relationship between the ellipsoid, geoid, and earth’s surface. Measurement of long baselines. Gravity and the geoid. Relationship between terrestrial observations and grid coordinates. Prerequisite: GISC 2470.

D. PREREQUISITES AND COREQUISITES

Prerequisites

SUR 211 and SUR 212

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Geodesy for Geomatics and GIS Professionals, by James A. Elithorp, Jr and Dennis D. Findorff, second edition, Copley Custom Textbooks (XanEdu Custom Publishing), Acton, MA, 2009. <http://www.xanedu.com/copley/elithorp.shtml>

Supplies

- None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course's student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Demonstrate understanding of the relationships between Geoid and Ellipsoid Distances.
2. Calculate basic parameters of a geoid.
3. Explain the worldwide 3-D coordinates systems associated with modern positioning with special emphasis on the National Spatial Reference System (NSRS) used in the United States. Work will include all major modern horizontal and vertical datums used in the United States. Students will be required to transform data between different systems.
4. Describe gravity measurements and their use in surveying and geodesy. This will lead to discussions of geodetic leveling as well as geoid modeling. We will study both purely gravimetric and hybrid models using both gravimetry and other data sources. Students will analyze the utility of various geoid models over specified geographic areas as a lab exercise.
5. Explain the role of GPS in modern geodesy

G. INSTRUCTIONAL METHODS AND ACTIVITIES

All lectures will be presented live in the classroom and recorded for posting online. In-person students will attend live lectures and labs while online students will watch lecture recordings and complete labs on their own time.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Student learning outcomes will be assessed through three examinations, an oral report, and a number of lab assignments.

ACTIVITY	% of FINAL GRADE (points)
Exams (2 @ 200)	40 (400)
Labs (12 @ 42)	50 (500)
Quizzes	10 (100)

I. COURSE CONTENT/SCHEDULE

<u>WEEK</u>	<u>TOPIC</u>	<u>CHAPTER(S)</u>	<u>ASSIGNMENTS</u>
1	Introduction & History of Geodesy	1	Lab 1: Software Familiarization
2	Latitude and Longitude	2	Lab 2: Intro to Geodesy Software
3	Ellipsoids	5	Lab 3: Ellipsoid Calculations
4	Gravity and related issues OPUS and an introduction to GPS	4	Lab 4: Gravity Calcs
5	Reduction of observations	3	Lab 5: Geodetic Computations
6	Geodetic Reference Systems	7	Lab 6: Geodetic Calcs
7	Midterm	N/A	N/A
8	Horizontal Datums in the US	8 (pp 130-147)	Lab 8: Horizontal Datum Conversions
9	Spring Break	Stay Safe and Have Fun	N/A
10	Vertical Datums in the US	8 (pp 127-130)	Lab 10: Vertical Datum Conversions
11	Tidal Datums	Handout	Lab 11: Tidal Datums
12	GPS and GNSS: Intro	12	Lab 12: GPS Computations
13	GPS: Project Planning	12	Lab 13: GPS Project Planning
14	Geodetic Leveling	Handout	Lab 14: Geodetic Leveling
Final Exam			

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments shown are directly related to the Student Learning Outcomes.

J. COURSE POLICIES

Attendance/Tardiness

Attendance at all times is compulsory

Late Work

Late work will not be graded.

Participation

Participation in all activities is compulsory.

K. COLLEGE AND UNIVERSITY POLICIES

Academic Integrity (University)

It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior. See the full University Policy at landsurveycareer.com/catalog

Deadline for Dropping a Course with a Grade of W (University)

The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (landsurveycareer.com/calendar) for the last day to drop a course

Grade Appeals (College of Science and Engineering)

A student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor.

Disability Services

Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual's documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office landsurveycareer.com/disability.

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GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.