

SUR 3103C • GEOMATICS

Course Syllabus • Fall 2024

Instructors

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Office hours: 4th period Wed & Thu (10:40 AM – 11:30 AM)

(or by appointment)

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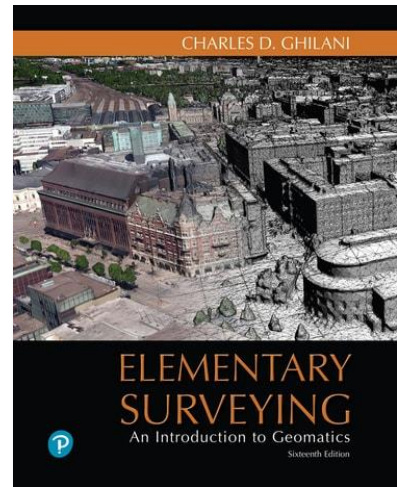
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(other times by Zoom appointment)



Text

Ghilani, C. *Elementary Surveying: An Introduction to Geomatics*. 16th Edition, Pearson Education, 2021. (Older editions 12th–15th are probably okay.)

Course overview

This course primarily covers plane surveying techniques, including measurement of angles, distances, and elevation differences. Also covered are the related techniques of data reduction for these fundamental measurements, the Global Positioning System, topographic mapping, Earth-based coordinate systems, boundary surveys, and horizontal curves.

Course objectives

Students must demonstrate knowledge and ability in the following:

- Significant figures
- Accuracy and precision; systematic and random errors
- Measurement of accurate horizontal distances, and horizontal and vertical angles
- Computation of horizontal coordinates by traverse adjustment
- Making vertical measurements by differential leveling
- Computation of elevations by level loop adjustment
- Bearing and azimuth calculation
- Computation of area of a parcel of land
- Production of a large-scale topographic map

Students should have gained general (introductory) knowledge in:

- Coordinate systems and datums
- The Global Positioning System
- Boundary surveys
- The United States Public Land Survey System
- Horizontal circular curves

Grading

Final grades for the course will be assigned based on the following point system:

Item	Points
Quizzes: 4 quizzes @ 30 points each	120
Homework: 5 assignments @ 10 pts each	50
Trigonometry review (Lab 1)	10
Station descriptions (Lab 1)	10
General lab work grade: 9 @ 25 pts each	225
Lab attendance: 12 sessions @ 5 pts each	60
Lab prep quizzes: 9 @ 5 pts each	45
Topographic mapping project (Lab 12)	60
Field book: Best note keeping grade*	20
Comprehensive final exam	150
TOTAL POSSIBLE POINTS	750

** Each student is required to take field notes for at least one session.*

Final class grades will be curved, but will be roughly based on 90=A, 80=B, 70=C, 60=D. Plus (+) and minus (-) will be included as appropriate. For an explanation of the UF letter grade scale, see: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Final exam

The final exam for the course will be held on Wednesday, December 11, 2024, from 7:30 AM to 9:30 AM. (We did not have any say in choosing the time.) The final exam is cumulative, covering the entire semester's topics. Be sure to plan accordingly because there will be no provision for an early exam.

Quizzes

Four quizzes will be given during the semester. Each quiz will cover the subject material of the lectures corresponding to the following list. The quiz may also cover the reading assignment associated with that lecture. There is no provision for making up a missed quiz.

Exceptions will be made only for extreme circumstances.

- Quiz 1 : Lectures 1–6
- Quiz 2 : Lectures 7–11
- Quiz 3 : Lectures 12–18
- Quiz 4: Lectures 19–25

Attendance

Attendance at all labs is mandatory. Absence will result in zeros for the attendance and general lab work grade for that day. Excuses will rarely be accepted, and if so, at the sole discretion of the instructor. Your lab partners are counting on you!

Lab equipment

Most of the equipment you will use is expensive (particularly the total stations). Handle with extreme care!

Academic honesty

In 1995 the UF student body enacted an honor code (see link below) and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

Preamble: In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Student Responsibility. Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council or Student Conduct and Conflict Resolution in the Dean of Students Office.

Faculty Responsibility. Faculty members have a duty to promote honest behavior and to avoid practices and environments that foster cheating in their classes. Teachers should encourage students to bring negative conditions or incidents of dishonesty to their attention. In their own work, teachers should practice the same high standards they expect from their students.

Administration Responsibility. As highly visible members of our academic community, administrators should be ever vigilant to promote academic honesty and conduct their lives in an ethically exemplary manner.

(Source: 2011– 2012 Undergraduate Catalog)

Homework submissions for this course may not be copied in part or in whole. While students are allowed to discuss concepts from the assignments with other students, all work must be independently produced.

This policy, along with the principles of the Student Honor Code, will be vigorously upheld at all times in this course.

Campus helping resources

University Counseling & Wellness Center

3190 Radio Road

352-392-1575

<https://counseling.ufl.edu/>

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling Services
- Groups and Workshops
- Outreach and Consultation
- Self-Help Library
- Training Programs
- Community Provider Database

Career Connections Center

Reitz Union Suite 1300

352-392-1601

<https://www.career.ufl.edu/>

Students with disabilities

Disability Resource Center

001 Reid Hall

352-392-8565

<https://disability.ufl.edu/>

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

Lecture syllabus and reading assignments

- Lec 1: Course introduction. Written field notes. Read: Chap 1 (all), Chap 2, sec 6-11.
- Lec 2: Units and significant figures. Chap 2, sec 1-5.
- Lec 3: Theory of errors in observations. Chap 3: Read sec. 1-8, Browse sec. 9-21
- Lec 4: Distance measurement - taping. Read: Chap 6, sec. 1-13
- Lec 5: Intro to Leveling. Read: Chap 4 (all).
- Lec 6: Leveling procedures and computations. Read: Chap 5 (all).
- Lec 7: Taping corrections. Read: Chap 6, sec. 14, Appendix: A.1
- Lec 8: Electronic distance measurement. Read: Chap 6, sec. 15-23.
- Lec 9: Angles, Azimuths, and Bearings. Read: Chap 7, sec. 1-9.
- Lec 10: Compass readings. Total Stations. Read: Chap 7, sec. 10-16; Read Chap 8, sec. 1-6.
- Lec 11: Horizontal and vertical angle measurement. Read: Chap 8: sec. 7-22
- Lec 12: Traversing. Read: Chap 9 (all).
- Lec 13: Traverse computations. Read : Chap 10, sec. 1-6.
- Lec 14-15: Traverse adjustment. Read: Chap 10: sec. 7-17.
- Lec 16: Area: coordinate and DMD methods. Read: Chap 12 (all).
- Lec 17-18: The Global Navigation Satellite System (GNSS) Intro and Principles. Read: Chap 13 (all).
- Lec 19: GNSS operations. Read: Chap 14, sec. 1-2; Browse: Chap 14 sec. 3-7. Browse Chap 15.
- Lec 20: Data collectors. Read Chap 2, sec. 12-15.
- Lec 21: Mapping surveys. Read Chap 17, sec. 1-10, 12-16.
- Lec 22: Interpreting and drawing contours. (Review 17.5-17.8, 17.9.2-17.9.3)
- Lec 23: Introduction to Mapping and Cartography. Read Chap 18 (all).
- Lec 24: Control surveys and Geodetic datums. Read: Chap 19 sec. 1-12, Browse sec. 13-14
- Lec 25: State plane coordinates. Read: Chap 20 sec. 1-5, 8-8.1, 9-11; Browse rest of chapter.
- Lec 26: Boundary surveys. Read: Chap 21 (all).
- Lec 27: United States Public Land Survey System. Read: Chap 22 (all).
- Lec 28: United States Public Land Survey System (continued)
- Lec 29*: Horizontal curves. Read: Chap 24: sec 1-4.

Lab activities

- Lab 1 Introduction and station descriptions
- Lab 2 Distances – taping and pacing (general lab work grade)
- Lab 3 Leveling (general lab work grade)
- Lab 4 Distances – EDM (Total station) (general lab work grade)
- Lab 5 Angle measurement, Day 1 (general lab work grade)
- Lab 6 Angle measurement, Day 2 if needed
- Lab 7 Traverse adjustment (general lab work grade)
- Lab 8 GPS exercise (general lab work grade)
- Lab 9 CAD exercise (general lab work grade)
- Lab 10 Planimetric mapping (general lab work grade)
- Lab 11 Contour mapping (general lab work grade)
- Lab 12 Map drafting

Calendar

Monday	Tuesday	Wednesday	Thursday	Friday
8/19	8/20	8/21	8/22 Lec. 1	8/23
8/26 Lab 1	8/27 Lec. 2 Lab 1	8/28	8/29 Lec. 3	8/30
9/2 <i>Labor Day</i> <i>No lab</i>	9/3 Lec. 4 <i>No lab</i>	9/4	9/5 Lec. 5	9/6
9/9 Trig review due Lab 2	9/10 Lec. 6 Lab 2	9/11	9/12 Lec. 7	9/13
9/16 HW #1 due Lab 3	9/17 Lec. 8 Lab 3	9/18	9/19 Lec. 9 Quiz 1	9/20
9/23 Lab 4	9/24 Lec. 10 Lab 4	9/25	9/26 Lec. 11	9/27
9/30 Lab 5/6	10/1 Lec. 12 Lab 5/6	10/2	10/3 Lec. 13	10/4
10/7 HW #2 due Lab 5/6	10/8 Lec. 14 Lab 5/6	10/9	10/10 Lec. 15 Quiz 2	10/11
10/14 Lab 7	10/15 Lec. 16 Lab 7	10/16	10/17 Lec. 17	10/18 <i>Homecoming</i>
10/21 Lab 8	10/22 Lec. 18 Lab 8	10/23	10/24 Lec. 19	10/25
10/28 HW #3 due Lab 9	10/29 Lec. 20 Lab 9	10/30	10/31 Lec. 21 Quiz 3	11/1
11/4 Lab 10	11/5 Lec. 22 Lab 10	11/6	11/7 Lec. 23	11/8
11/11 <i>Veterans Day</i> <i>No lab</i>	11/12 Lec. 24 <i>No lab</i>	11/13	11/14 Lec. 25	11/15
11/18 Lab 11	11/19 Lec. 26 Lab 11	11/20	11/21 Lec. 27 Quiz 4	11/22 HW #4 due
11/25 <i>Thanksgiving break</i> <i>(all week)</i>	11/26	11/27	11/28	11/29
12/2 Lab 12	12/3 Lec. 28 (& 29?) Lab 12	12/4	12/5 <i>Reading day</i>	12/6 <i>Reading day</i>
12/9 HW #5 due	12/10	12/11 Final exam 7:30 AM – 9:30 AM	12/12	12/13