

SUR 3103C • GEOMATICS

Course Syllabus • Spring 2025

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1. Course overview

Course description

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 prerequisites

None.

Instructor

Dr. Andrew Lassiter

Reed Lab 406A

halassiter@ufl.edu

(352) 846-0858

Required text

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

2. Learning outcomes

By the conclusion of this course, 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

3. Course logistics

This course consists of lecture videos that will be provided each week, and quizzes, homework assignments, and labs complement the lecture material. All course materials will be provided through the UF E-Learning Canvas site (<https://elearning.ufl.edu/>) on the course page. Office hours are available as needed via phone or Zoom.

Survey mentor and equipment requirement

Due to the distance format of this course, ***each student is required to have access to a local survey mentor and survey equipment.*** Please have your mentor complete the UF Geomatics Mentor Form right away. The form is available in the associated assignment in Canvas. Scan and submit the form via the Canvas assignment page.

The survey mentor should be able to assist with labs, provide equipment, and demonstrate how to use survey equipment. A licensed surveyor is required. Students working in a survey office may use someone within the office. Also, students can inquire with local survey businesses or city, county, state or federal entities for a survey mentor. These entities may include water management districts, Army Corps of Engineers, or city/county government services (survey departments). ***If a survey mentor cannot be found, please contact the instructor immediately.***

Homework and assignments

All homework and other assignments, as well as “office” components of the labs, are required to be completed individually. Office work includes calculations, computer drafting, and any similar activities not performed in the field.

Quizzes and final exam

All quizzes/exams will be administered via Honorlock, which requires a webcam. A practice quiz will be provided to ensure students have the correct setup. Students will be required to perform calculations for the quiz/exam. Quizzes and exams must be taken during their assigned times. Please see the schedule for quiz/exam dates. There is no provision for making up a missed quiz or the final exam. If you have a conflict, please notify the instructor prior to the quiz/exam. Leniency in rescheduling a quiz is dependent upon advanced notification and reason.

All quizzes and the final exam are closed notes and book. A calculator may be used, but not a programmable surveying calculator.

Quizzes will cover the subject material of the lectures, reading assignments, lab exercises, and homework problems. Some quizzes may contain more/less information based on lectures covered. The following list serves as a general guide:

- Quiz 1 (lectures 1-6)
- Quiz 2 (lectures 7-11)
- Quiz 3 (lectures 12-18)
- Quiz 4 (lectures 19-25)
- Final Exam: cumulative (all lectures)

See schedule below for dates.

Labs

Labs should be completed under the supervision of the survey mentor, who must fill out the provided form and have access to the appropriate equipment (see Agreement and Guidelines documents). An appropriate parcel site for field labs is also required **and will be approved by the instructor through a Canvas assignment**. Approximately one lab should be completed per week, as scheduled to correspond to the lecture videos. Labs may be completed at any time during the assigned week, and lab field notes/deliverables and reports should be submitted by the associated deadlines.

Technology requirements

- A computer or mobile device with high-speed internet connection.
- A webcam, headset and/or microphone, and speakers.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser.
- Installation of proctoring software may be required and will be provided if so.

Synchronous online sessions may be recorded. By sharing your video, screen, or audio during any synchronous online class sessions, you are consenting to being recorded for the benefit of students who cannot attend live as well as for class review during the current semester. If you have special circumstances or concerns about privacy, it is your responsibility to discuss it with your instructor.

3.1 Description of assessments & activities

Item	Description	Points
Mentor form	Signed by licensed surveyor agreeing to mentor you	20
Parcel plan	Approval of parcel layout	10
Honorlock practice quiz	Practice quiz to test Honorlock setup and requirements	10
Quizzes	4 @ 30 points each	120
Homework	5 @ 10 points each	50
Trigonometry review	Trigonometry refresher: Solving triangles	15
Station descriptions	Lab 1	10
General lab work	9 labs @ 25 points each	225
Lab reports	12 @ 5 points each	60
Topographic mapping	Final AutoCAD drawing of your parcel	60
Field book note keeping	Scans of field book required as appropriate	20
Final exam	Cumulative	150
Total possible points		750

3.2 Grades and grading scale

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>.

4. Learning content

Lecture syllabus and reading assignments

- Lec 1: Course introduction. Written field notes. Read: Ch. 1 (all), Ch. 2 §6-11.
- Lec 2: Units and significant figures. Ch. 2 §1-5.
- Lec 3: Theory of errors in observations. Ch. 3: Read §1-8, browse §9-21
- Lec 4: Distance measurement - taping. Read: Ch. 6 §1-13
- Lec 5: Intro to leveling. Read: Ch. 4 (all).
- Lec 6: Leveling procedures and computations. Read: Ch. 5 (all).
- Lec 7: Taping corrections. Read: Ch. 6 §14, Appendix A.1
- Lec 8: Electronic distance measurement. Read: Ch. 6 §15-23.
- Lec 9: Angles, azimuths, and bearings. Read: Ch. 7 §1-9.
- Lec 10: Compass readings. Total Stations. Read: Ch. 7 §10-16, Ch. 8 §1-6.
- Lec 11: Horizontal and vertical angle measurement. Read: Ch. 8 §7-22
- Lec 12: Traversing. Read: Ch. 9 (all).
- Lec 13: Traverse computations. Read: Ch. 10 §1-6.
- Lec 14, 15: Traverse adjustment. Read: Ch. 10 §7-17.
- Lec 16: Area: Coordinate and DMD methods. Read: Ch. 12 (all).
- Lec 17, 18: Global Navigation Satellite System (GNSS) Intro and Principles. Read: Ch. 13 (all).
- Lec 19: GNSS operations. Ch. 14: Read §1-2, browse Ch. 14 §3-7. Browse Ch. 15.
- Lec 20: Data collectors. Read Ch. 2 §12-15.
- Lec 21: Mapping surveys. Read Ch. 17 §1-10, 12-16.
- Lec 22: Interpreting and drawing contours. (Review Ch. 17 §5-8, 9.2, 9.3)
- Lec 23: Introduction to mapping and cartography. Read Ch. 18 (all).
- Lec 24: Control surveys and geodetic datums. Ch. 19: Read §1-12, browse §13-14.
- Lec 25: State plane coordinates. Read: Ch. 20 §1-5, 8-8.1, 9-11; browse rest of chapter.

- Lec 26: Boundary surveys. Read: Ch. 21 (all).
Lec 27: United States Public Land Survey System. Read: Ch. 22 (all).
Lec 28: United States Public Land Survey System (continued).
Lec 29*: Horizontal curves. Read: Ch. 24 §1-4.

Lab activities

- Lab 1 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

Course schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1/13 <i>UF 1st day of class</i> Lecture 1, 2	1/14	1/15	1/16	1/17	1/18	1/19
1/20 <i>Holiday – MLK</i>	1/21 Lecture 3, 4	1/22 Trig review due	1/23	1/24	1/25	1/26 Lab prep due
1/27 Lecture 5, 6	1/28	1/29	1/30	1/31	2/1	2/2 Lab 1 due
2/3 Lecture 7,8	2/4	2/5 HW 1 due	2/6	2/7	2/8	2/9 Lab 2 due
2/10 Lecture 9, 10	2/11	2/12 Quiz 1	2/13	2/14	2/15	2/16 Lab 3 due
2/17 Lecture 11, 12	2/18	2/19	2/20	2/21	2/22	2/23 Lab 4 due
2/24 Lecture 13, 14	2/25	2/26 HW 2 due	2/27	2/28	3/1	3/2
3/3 Lecture 15, 16	3/4	3/5 Quiz 2	3/6	3/7	3/8	3/9 Lab 5 & 6 due
3/10 Lecture 17, 18	3/11	3/12	3/13	3/14	3/15 <i>Spring break begins</i>	3/16
3/17	3/18	3/19	3/20	3/21	3/22 <i>Spring break ends</i>	3/23 Lab 7 due
3/24 Lecture 19, 20	3/25	3/26 HW 3 due	3/27	3/28	3/29	3/30 Lab 8 due
3/31 Lecture 21, 22	4/1	4/2 Quiz 3	4/3	4/4	4/5	4/6 Lab 9 due
4/7 Lecture 23, 24	4/8	4/9	4/10	4/11	4/12	4/13 Lab 10 due
4/14 Lecture 25, 26	4/15	4/16 HW 4 due	4/17	4/18	4/19	4/20 Lab 11 due
4/21 Lecture 27, 28*, 29*	4/22	4/23 <i>Last day of class</i> Quiz 4	4/24 <i>Reading day</i>	4/25 <i>Reading day</i>	4/26	4/27 Lab 12 due
4/28 HW 5 due	4/29	4/30 FINAL EXAM	5/1	5/2	5/3	5/4

Note that lectures are available for more than the full week and can be completed at the student's pace, but should be completed taking quiz, exam, and lab work dates into consideration. Lab field work may be completed during the previous week, with the deliverables and report due on the dates noted. **Quizzes and the exam must be completed on the designated day.**

5. Policies and requirements

This syllabus represents current plans and objectives for this course. As the semester progresses, changes may need to be made to accommodate timing, logistics, or to enhance learning. Such changes, communicated clearly, are not unusual and should be expected.

5.1 Late submissions & make-up requests

It is the responsibility of the student to access online lectures, readings, and quizzes to maintain satisfactory progress in the course.

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues **MUST** be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You **MUST** e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number, (352) 392-HELP (4357), option 2.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

5.2 Communication courtesy and professionalism

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. **Respect for individual differences and alternative viewpoints will be maintained in this class at all times.** All members of the class are expected to follow rules of common courtesy, decency, and civility in all email messages, threaded discussions, and chats. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students' Office (<http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>Student).

5.3 Semester evaluation process

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest, Fisheries, & Geomatics Sciences will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is not the UF Faculty Evaluation!

At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>.

Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

5.4 Academic honesty policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following 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.”

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct or appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

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

5.5 Inclusive learning environment

This course embraces the University of Florida’s Non-Discrimination Policy, which reads:

The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans’ Readjustment Assistance Act.

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <http://multicultural.ufl.edu>.

5.6 Services for students with disabilities

The Disability Resource Center coordinates the accommodation needed by 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. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/.

5.7 Software use

All faculty, staff, and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal

penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Other requirements

Cellular phones must be turned off during class. They may be used in field sessions for field work communication pertaining to this course work only.

6 Campus helping resources

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- learning-support@ufl.edu | (352) 392-HELP - select option 2 | <https://elearning.ufl.edu>
- Library Help Desk support <https://cms.uflib.ufl.edu/ask>
- SFFGS Academic Hub <https://ufl.instructure.com/courses/303721>

6.1 Student life, wellness, and counseling help

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 and Wellness resources <https://www.counseling.ufl.edu/cwc/>
- U Matter, We Care <https://www.umatter.ufl.edu/>
- Career Connections Center <https://career.ufl.edu/>
- Other resources are available at <https://www.distance.ufl.edu/getting-help> for online students

6.2 Student complaint process

The School of Forest, Fisheries, & Geomatics Sciences cares about your experience and we will make every effort to address course concerns. We request that our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered. You can also submit feedback anytime.

If you have a more urgent concern, your first point of contact should be the Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- Students in online courses: <https://www.distance.ufl.edu/student-complaint-process>
- Students in face-to-face courses: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>