
Survey Computations- SUR 3641

1 Overview

This is an introductory course in surveying computations. The material delivered in this course improves students' skills for solving surveying and geometric problems. The material also reviews basic calculus and trigonometric concepts in preparation for future surveying coursework.

- 3 Credits - Fall Semester
- Format: Online recorded classes will be posted weekly on canvas. Assignments, quizzes, exams, and discussions will be administered using canvas
- <http://elearning.ufl.edu/>

Instructor:

Dr. Amr Abd-Elrahman (Phone: 813.757.2283, Email: aamr@ufl.edu). Please use gator link email (aamr@ufl.edu) for the fastest response.

Office hours on Tuesday 1:00-2:00pm, Thursday 3:00-4:00pm, and by appointment.

Textbook(s) and/or readings:

Recommended Textbooks:

1. Ghilani, Charles & Wolf, Paul R. (2017). *Elementary Surveying* (15th edition.). Pearson Prentice Hall. ISBN: 978-0134604657.

Notes:

- Elementary Surveying is the same book used for the Geomatics SUR3103 course.
 - The 14th edition of the book should be fine too.
2. Anderson, James M., & Mikhail, Edward M. (1998). *Surveying: Theory and Practice* (7th edition). McGraw Hill. ISBN: 0-07-015914-9

Additional Material:

- Handouts and links to websites covering mathematical content topics will be given throughout the semester.

2 Learning Outcomes

At the conclusion of this course, the student will be able to:

- comprehend the role of surveying computations in a surveying process
- perform basic calculus and trigonometric operations
- utilize algebra and trigonometric operations to solve coordinate geometry computations problems
- solve area partitioning with constraints problems
- implement basic calculus operations such as full and partial derivatives in survey computations
- perform basic matrix algebra computations in surveying

*Zoom is a software program used to conduct virtual meetings. Link will be announced to the class earlier in the semester and will be posted in the class pages in canvas. More information about Zoom can be found [here](#)

3 Course Logistics

All lectures are recorded and delivered online. Lecture recording links will be posted weekly on canvas. Students are required to watch the recordings as they become available, and are highly recommended to take notes promptly while watching.

Learning modules consisting of lecture recordings, readings, and supporting material are provided online for each topic. Learning modules build on previous modules so you should complete the learning modules in the order they are presented.

Technology Requirements:

- A computer with high-speed internet connection.
- A headset (microphone and speakers) and a web cam is suggested in case office hours zoom meetings are requested.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser. [What browser am I using?](#)

Using Zoom Software

Office hour meetings will be conducted using the Zoom software. The software is accessed by clicking a link posted by the Instructor through e-Learning. You should click on the link each time you need to join the office hour sessions.

Please check <https://support.zoom.us/hc/en-us/articles/201362023-System-Requirements-for-PC-Mac-and-Linux> for more information about Zoom software use requirement. Zoom supports nearly any operating system including Windows, Macintosh, and Linux, as well as the most widely used browsers including Internet Explorer, Firefox, Safari, and Chrome. A microphone is also needed to communicate with the Instructor and the students attending the session.

In Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the University, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited.

Specifically, students may not publish recorded lectures without the written consent of the instructor. A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

3.1 Assignments & Deliverables

Homework Assignments:

Homework solutions can be prepared in EXCEL or as handwritten documents. Excel homework submissions need to be neatly prepared and contain all the textual information allowing the Instructor to understand solution workflow and embedded calculations. Handwritten homeworks need to be scanned and accompanied by supporting Excel sheet (if any). All homework should be turned in electronically through the canvas website. All scanned homework pages **NEED TO BE IN A SINGLE PDF** file. Homework file name should be: Course Prefix & Number - HW# - Student Last Name-First Name. For example, for an Albert Gator EXCEL submission for SUR3641 Survey Computations, Homework Assignment 1, file name will be:

SUR3641-HW1-Gator-Albert.xls

Files not named appropriately will not be graded. In the case of scanned submission, an additional deliverable can be a supporting Excel sheet that will be checked only to trace errors in the main submission (word or pdf) file. **All assignments need to include the following on the first sheet:**

- a. Student Name: Albert Gator
- b. Date: MM/DD/2019
- c. Homework #: 1 & Class: SUR3641

Page setup for assignments is the responsibility of the students. All assignments turned in electronically (both scanned and/or EXCEL documents) need to be printable on 8.5" X 11" paper. Thus, when the file is opened, the print button can be pressed without any modifications to the page setup. Students should use one sheet in EXCEL (not multiple) and continue problem solving down the rows in the Excel sheet. If there are cells that fall outside the page breaks, then it is possible they could get excluded during the grading process. Again, the student is responsible for making sure their work is appropriately formatted.

PLEASE START WORKING ON YOUR HOMEWORK ASSIGNMENTS IMMEDIATELY AFTER THEIR RELEASE.

Also, pay attention to the assignment in-class discussions normally offered by the time the assignment is released. It is important to solve the assignments promptly and in the order they are released since the knowledge and skills learnt in one assignment may be needed in subsequent ones.

Assignment feedback will be communicated through the canvas course website. Comments will be provided mainly using the grading portal of each assignment. Some comments may be returned using the canvas email system. This could happen if quick individual notes need to be delivered to the students while grading is undergoing. Students are encouraged to review and digest the comments promptly to avoid recurring errors.

Collaboration on homework assignment problems is allowed through canvas discussions. Collaboration means working together on understanding a problem or a concept. However, solving the problems must be done individually and independently.

Quizzes & Exams: (COLLABORATION ON QUIZZES AND EXAMS IS PROHIBITED)

A total of four quizzes will be administered online through the course e-learning (canvas) web page. Although the quizzes assess the material covered recently in the lectures, cumulative skills may be needed.

Two midterm exams will be offered online through canvas. The first midterm exam will be offered approximately in week 9 and the second midterm in the last week of the classes. Post-quiz and midterm exam reviews will be conducted on an individual basis using special Zoom sessions when requested.

Participation

Virtual (online) discussion topics will be created in the course website (Canvas). You are required to read, post and interact in these discussions. Please contribute positively to the discussions by providing useful/tested technical tips as well as innovative and critical thoughts. You are also encouraged to enrich course resources with online material by posting in the canvas discussions created by the Instructor. Participation grade will be issued based on the quantity and quality of your participation in the course online discussion.

3.2 Grades & Grading Scale

<i>Grading Item</i>	<i>Percentage</i>
Homework Assignments	25%
Participation	10%
Quizzes	15%
Midterm 1	25%
Midterm 2	25%

Please note that we are using the + and - grading scale encouraged by UF. For more information about the new grading system, please visit <http://www.isis.ufl.edu/minusgrades.html>

Grade Scale

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Corresponding Course Score	95-100	90-94	85-89	80-84	75-79	70-74	65-69	60-64	55-59	50-54	45-49	0-44
Grade Points	4	3.67	3.33	3	2.67	2.33	2	1.67	1.33	1	0.67	0

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

4 Course Content#

Module	Week of	Lecture Topic – Reading	Tentative HW/Exam Release
1. Introduction to Surveying Computations	Week 1 Aug. 22	Surveying computations history, need and types. R: "Elementary Surveying" Ch 1 pp. 1-12	
	Week 2 Aug. 29	Introduction to computations using MS Excel R: Web material	Assign. 1
2. Trig and Geometry Concepts for Surveying Computations	Week 3 Sept. 05	Review of geometric and trigonometric functions and relationships R: Surveying Theory and Practice: Appendix A pp. 1053-1063	
	Week 4 Sept. 12	Review of line and circle geometric properties R: "Surveying Theory and Practice" App. A pp. 1063-1077	Assign. 2
3. Coordinate Geometry Computations	Week 5 Sept. 19	Coordinate geometry operations R: "Elementary Surveying" Ch 10 pp. 238-242; pp. 252-253	
	Week 6 Sept. 26	Coordinate Geometry Computation Applications Positioning using intersection by angle and distance R: "Elementary Surveying" Ch 11 pp. 268-273	Assign. 3
	Week 7 Oct. 03	Line circle and two circles intersection computations R: "Elementary Surveying" Ch 11 pp. 276-283	Assign. 4
	Week 8 Oct. 10	Positioning using intersection and resection angles R: "Elementary Surveying" Ch 11 pp. 276-285	Assign. 5
	Week 9 Oct 17	Midterm 1 Exam Review	Midterm 1
4. Tract Area Calculation and Partitioning	Week 10 Oct 24	Point Positioning with Elevations & Review R: "Elementary Surveying" Ch 11 pp. 290-294	Assign. 6
	Week 11 Oct 31	Area computations for geometric figures and traverse R: "Surveying Theory and Practice" Ch 8 pp. 429-434	Assign. 7
5. Review of Calculus for Survey Computations	Week 12 Nov. 07	Tract partitioning based on area criteria R: Ch 8 "Surveying Theory and Practice" pp. 440-446	
	Week 13 Nov. 14	Introduction to matrix algebra - - Linear Equation Systems R: "Surveying Theory and Practice" App B pp.1090-1106	Assign. 8
	Week 14 Nov. 21	Coordinate Transformation Using Matrix Operations R: "Elementary Surveying" Ch. 11 pp. 286-289	Assign. 9
6. Applications of Calculus in Survey Computations	Week 15 Nov. 28	Partial Derivatives, Error Propagation, Matrix Differentiation R: Lecture Slides & "Surveying Theory and Practice" App B pp. 1107	
7. Review	Week 16 Dec. 05	Midterm 2 Exam Review	Midterm 2

Schedule is tentative and subject to change due to actual course delivery circumstances

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 the online lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course.

Late submissions are subject to 25% penalty for every week after the due date. For example, submissions within the first week after the due date will get up-to 25% discount and submissions within the second week after due date will be subject to up-to 50% discount, etc. Examples for the reasons justifying missing course activities can be found in

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>. Please contact me if you have any unusual circumstances as soon as possible to arrange for make-up plans.

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** email the 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 = 352- 392-4357 (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 interactions. 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.

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 Resources & Conservation 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:

<http://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 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. 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.

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 | <http://elearning.ufl.edu>
- Library Help Desk support <http://cms.uflib.ufl.edu/ask>
- SFRC 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 <http://www.counseling.ufl.edu/cwc/>
- U Matter, We Care <http://www.umatter.ufl.edu/>
- Career Connections Center <http://career.ufl.edu/>
- Other resources are available at <http://www.distance.ufl.edu/getting-help> for online students.

6.2 Student Complaint Process

The School of Forest Resources & Conservation cares about your experience and we will make every effort to address course concerns. We request that all of 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.

If you have a more urgent concern, your first point of contact should be the SFRC 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: <http://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/>