

# Geomatics - SUR 3103C (spring 2017)

## 1 Overview

This 3-credit 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.

**Instructor:** Katie Britt (Phone: 813.757.2183; Email: [k.britt@ufl.edu](mailto:k.britt@ufl.edu), Office: Plant City, PEPC 116A)

- Please use gatorlink email ([k.britt@ufl.edu](mailto:k.britt@ufl.edu)) for fastest response.
- Avoid using the Canvas site “inbox” for email/messages due to occasional delay in delivery.
- Office hours: as needed by appointment via Adobe Connect<sup>1</sup>, phone, or email.

### Required Text:

Ghilani, C. D. and P. R. Wolf. Elementary surveying – An introduction to geomatics. 14th ed. Upper Saddle River: Pearson Education, 2014. ISBN-13: 978-0-13-375888-7

## 2 Learning Outcomes

At 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 US public land survey
- Horizontal circular curves

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<sup>1</sup> Adobe Connect is a software program used to conduct virtual meetings. See provided information in the introductory module.

### 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. Office hours are available as needed via phone or Adobe Connect.

#### **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 as soon as possible. Scan and submit the form to the instructor via email.)** The survey mentor should be able to assist with labs, proctor quizzes/exams, 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 and the UF Geomatics Mentor Form completed, please contact the instructor immediately.

#### **Homeworks/Assignments**

All homeworks 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 require a proctor. Students will be required to perform calculations for the quiz/exam. The proctor/mentor will scan all work associated with the quiz and return it to the instructor at the end of the scheduled quiz/exam time. A suitable scanner should be accessible for scanning the quizzes/exam. If a scanner is not readily available, please notify the instructor as soon as possible. Students will not receive points for questions requiring calculations, if the scan calculations page is not provided. 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.

To get full credit for computational problems on homework, quizzes, and the final exam, students must show intermediate work. Programmable calculators may be used, however the student must demonstrate an understanding of the solution by showing the intermediate steps. All quizzes and the final exam are closed notes and book. A suitable scanner should be accessible for scanning the quizzes/exam. If a scanner is not readily available, please notify the instructor as soon as possible.

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 1-5), Quiz 2 (lectures 6-11), Quiz 3 (lectures 12-17), Quiz 4 (lectures 18-25)  
See schedule for dates.

The final exam is scheduled for **April 24, 2017 from 12:30 pm to 2:30 pm.**

## 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. 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.

### 3.1 Assignments & Deliverables

Graded Item	Description	Points
Quizzes	4 at 30 points each	120
Homework		50
Trigonometry Review		10
Station Descriptions	Lab 1	10
Field Work Grades	6 labs at 25 points each	150
Lab attendance/reports	12 at 5 points each	60
Traverse Adjustment		30
GPS Exercise		20
CAD Exercise		20
Topographic Mapping		60
Field Book Note keeping	Scans of field book required as appropriate	20
Final Exam	cumulative	150
<b>Total Possible Points</b>		<b>700</b>

### 3.2 Grades & Grading Scale

**Final grades may be curves, but will be roughly based on the listed grading scale. Plus or minus grades will be assigned as appropriate.**

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

#### Grading Scale (%)

A 90-100  
B 80-89.99  
C 70-79.99  
D 60-69.99  
E < 60

## 4 Course Content

### Learning Modules

Learning modules will contain the following content and supplementary materials.

### **SUR3103C – 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: Intro to Leveling. Read: Chap 4 (all).
- Lec 5: Leveling procedures and computations. Read: Chap 5 (all).
- Lec 6: Distance measurement - taping. Read: Chap 6, sec. 1-13
- Lec 7: Taping corrections. Read: Chap 6, sec. 14-16
- Lec 8: Electronic distance measurement. Read: Chap 6, sec. 17-25.
- 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 Positioning System (GPS) Intro and Principles. Read: Chap 13 (all).
- Lec 19: GPS 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, 12-13.
- Lec 22: Interpreting and drawing contours. (Review 17.5-17.8, 17.9.2)
- Lec 23: Mapping and AutoCAD intro. 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.
- Lec 30: Review and example problems

### **SUR 3103C – Lab activities**

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

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Jan 2017</b>	<b>2</b>	<b>3</b>	<b>4</b> Intro/Syllabus First Day of Classes	<b>5</b> Lecture 1	<b>6</b>
	<b>9</b> Lecture 2,3	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
	<b>16</b> Lecture 4,5 lab 1 work	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
	<b>23</b> Lecture 6,7 lab 2 work	<b>24</b> Quiz 1	<b>25</b>	<b>26</b>	<b>27</b> Lab 1
	<b>30</b> Lecture 8,9 lab 3 work	<b>31</b>	<b>1</b>	<b>2</b>	<b>3</b> Lab 2
	<b>6</b> Lecture 10,11 lab 4 work	<b>7</b>	<b>8</b>	<b>9</b> Quiz 2	<b>10</b> Lab 3
<b>Feb 2017</b>	<b>13</b> Lecture 12,13 lab 5 work	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b> Lab 4
	<b>20</b> Lecture 14,15 lab 6 work	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b> Lab 5
	<b>27</b> Lecture 16,17 lab 7 work	<b>28</b>	<b>1</b>	<b>2</b>	<b>3</b> Lab 6
	<b>6</b> Lecture 18,19	<b>7</b>	<b>8</b>	<b>9</b> Quiz 3	<b>10</b> Lab 7
<b>Mar 2017</b>	<b>13</b> Lecture 20,21 lab 8 work	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>
	<b>20</b> Lecture 22,23 lab 9 work	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b> Lab 8
	<b>27</b> Lecture 24,25 lab 10 work	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b> Lab 9
	<b>3</b> Lecture 26,27 lab 11 work	<b>4</b> Quiz 4	<b>5</b>	<b>6</b>	<b>7</b> Lab 10
<b>Apr 2017</b>	<b>10</b> Lecture 28,29 lab 12 work	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b> Lab 11
	<b>17</b> Lecture 30	<b>18</b>	<b>19</b> Lab 12 Last Day of Classes	<b>20</b>	<b>21</b>
	<b>24</b> Final Exam	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>

Note that lectures are available for full week and can be completed at the students pace, but should be completed taking quiz, exam, and lab work dates into consideration. Lab field work may be completed during the highlighted 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 on-line lectures, readings, quizzes, and exams and 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 = 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 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 UF with feedback on the quality of instruction in this course using a standard set of university and college criteria (UF Faculty Evaluations). These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

### 5.3 Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. Failure to do so may result in loss of participation points and/or referral to the Dean of Students' Office. <http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

Please include the course code (SUR 3103C) in the subject line of emails.

## 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 University Policy on Accommodating Students with Disabilities:

Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams.

Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

## 5.6 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 Getting Help

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](mailto: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

- Counseling and Wellness resources <http://www.counseling.ufl.edu/cwc/>
- U Matter, We Care <http://www.umatter.ufl.edu/>
- Career Resource Center <http://www.crc.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://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)