GISC 2470: Geospatial Plane Measurement I

4 sem. hrs.

Course: MW 9:00 - 9:50 AM CI 229
Lab: Friday 12:00 - 4:00 PM
CBI Conference or CI 229 (TBA)

Dr. Stacey D. Lyle, RPLS
Office: CBI 108, Phone: 825-3712
EMail: slyle@tamucc.edu
Office Hours:
Mon, Wed, Fri 11-12PM or by appointment Please Note: Sometimes meetings are called during my office hours, so contact me before coming – that is, try and arrange your meeting with me in advance.

GISC 2470: Geospatial Plane Measurement I

COURSE DESCRIPTION:
Historical introduction to field measurement and mapping; review of trigonometry; angular and distance measurement using electronic distance meters; calibration and reduction. Leveling instruments; principles, construction, testing and adjustment; ancillary equipment. Optical and electronic theodolites. Traverse computations and adjustment. Coordinate systems. Map projections. Prerequisites: COSC 1315 or MATH 1316 or GISC 1470.

STUDENTS LEARNING OUTCOMES:
1. Understand the principles of measurements in horizontal and vertical planes.
2. Familiarize with the concepts of land measurement and plane surveying.
3. Be familiar with the instrumentation used to carry out horizontal and vertical measurements.
4. Be capable of undertaking a closed traverse.
5. Be capable of undertaking a closed level loop.
6. Be capable of undertaking a detail survey.
7. Be familiar with the history of survey measurement.

REQUIRED TEXTS:

COURSE REQUIREMENTS:

ASSESSMENT:
1) Labs
1.1) Final Project 15%
1.2) Field 20%
2) Tutorials 15%
2) Mid-semester Quiz. 25%
4) End-semester Quiz. 25%
TOTAL 100%

Class Attendance: Students should follow the university policy as stated in the catalog. Three (3) unexcused absences will lower student Final Grade by one letter grade.
### COURSE OUTLINE

#### WEEK MATERIAL

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic-Assignments-Nature</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION: Overview of course objectives and requirements. Definitions. History of measurement.</td>
<td>1, 2, 6, &amp; 7</td>
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<tr>
<td>3</td>
<td>OVERVIEW OF HORIZONTAL POSITION: The Theodolite and Total Station. Directions and angles. Bearings and azimuth. Compass. Field notes.</td>
<td>1, 2, 3, &amp; 4</td>
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<td>4</td>
<td>DISTANCES: Electronic distance meters, the use of measuring tapes, and pocket tapes. Plane coordinate systems.</td>
<td>1, 2, 3, &amp; 4</td>
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<tr>
<td>5</td>
<td>FIELD OPERATIONS WITH TOTAL STATIONS: Procedures for efficient use of the total station.</td>
<td>1, 2, 3, &amp; 4</td>
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<tr>
<td>6</td>
<td>TRAVERSING: Closed traverses and their uses.</td>
<td>1, 2, 3, &amp; 4</td>
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<td>8</td>
<td>LEVELING THEORY, EQUIPMENT, AND METHODS: The principles of leveling. Datums. Curvature and refraction. Elevation differences. Types of levels and rods.</td>
<td>1, 2, 3, 5, 6, &amp; 7</td>
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<tr>
<td>10</td>
<td>CONTROL SURVEYS: Reference datums. Accuracy and standards for control. Triangulation and resection.</td>
<td>1, 2, 3, 5, &amp; 6</td>
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<tr>
<td>11</td>
<td>AREA: Methods of measuring area. Error sources.</td>
<td>1, 2, 3, 5, &amp; 6</td>
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<td>12</td>
<td>STADIA AND TOPOGRAPHIC SURVEYS: Optical distance measurement. Methods for topographic surveys.</td>
<td>1, 2, 3, 5, &amp; 6</td>
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<tr>
<td>13</td>
<td>MAPPING: Aspects of map production and map use.</td>
<td>1, 2, 3, 5, &amp; 6</td>
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<tr>
<td>14</td>
<td>COURSE OVERVIEW: Review of plane spatial measurements in geomatics.</td>
<td>1, 2, 3, 4, 5, 6, &amp; 7</td>
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**Notice to Students with Disabilities:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**ACADEMIC ADVISING:** The College of Science and Technology requires that students meet with an Academic Advisor Office: FC 168. Phone: 825-5797. Zip+4: 5806. URL: [http://www.sci.tamu.edu/camsadvising/](http://www.sci.tamu.edu/camsadvising/). Contact the academic advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair.
**Grade Appeal Process.** As stated in University Rule 13.02.99.C2, Student Grade Appeals, 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. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 1.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

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**GENERAL GUIDELINES FOR COURSES AND LABS**

**IN THE GISC PROGRAM**

*CULTURE, REGULATIONS, MODES OF OPERATION AND PROCEDURES*

*These guidelines are designed to inform scholars of their responsibilities and of the course requirements in order to make this course a positive experience. The instructor is always available for consultation and discussion with students on any aspect of a course and of these general guidelines.*

**CLASS CULTURE**

1. Consider yourself as a **scholar** rather than a student. The term “student” may imply some passivity, whereas the term “scholar” implies active participation, understanding and searching. We will use these terms interchangeably with the meaning of “scholar” implied. Osmosis does not work in a learning environment! **A good scholar takes NOTES at every class meeting.**

2. Further, define yourself as a “thinking explorer”. You are responsible for your education; an instructor can only be a guide and a facilitator. An instructor cannot learn for you. If you come across something that really interests you, explore it further.

3. Your experience at this University should not consist of passing a series of courses to earn a degree. Your experience should rather be a series of activities that will give you an education.

4. Concentrate on “learning to learn”. You will have to be a life-long learner to survive in your chosen career.

5. There is no such thing as a stupid question; there is such a thing as a stupid answer. So ask questions, the instructor is taking all the risks! Ask questions of your instructor and of your fellow scholars. Many times questions are more important than answers.

6. Keep copious notes of all that is going on in all the meetings related to your course. Make a note of what the instructor is stressing. At the end of each lecture you should be able to answer two questions: **What did I learn from this lecture?** and **What was not clear to me?** At the beginning of each lecture, if the instructor does not ask for questions, you need to ask if there is something you did not understand from the last lecture. Review, consolidate, annotate and organize your lecture/lab notes on a regular basis, at least once a week. The Internet is a tremendous resource and also a great danger. When you find information on the Internet, you have no idea if it is correct. View such information with caution. But, use the Internet to explore topics that interest you. Do not only prepare for the exam in a course – learn as much as you can on the topics introduced to you by the course material. You are responsible for the extent of your education! **READ MINDFULLY !!!!!**

7. In addition to details of the syllabus given in class, the syllabus for the course includes all the chapters of the required textbook/s unless indicated otherwise by the instructor. The student is responsible for all materials/topics covered in class, in handouts, in assignments, in labs, and in outings or field trips. The instructor is NOT responsible for informing absent students exactly what was covered in previous classes, meetings, etc.

**PROCEDURES & REGULATIONS**

8. The final letter grade for the class will be based on the raw composite numerical score obtained from the weighted average of the tests, quizzes, exams, labs, etc. as indicated by the instructor. The raw composite numerical score may be adjusted (curved) based on the highest score, the statistical profile of the scores and other academic standards or other considerations. Generally the letter grade of A is 90% and over of the adjusted score, a B is between 80% and 89% (inclusive) of the adjusted score, a C is between 70% and 79% (inclusive) of the adjusted score, a D is below 70% of the adjusted score and an F is below 60% of the adjusted score. An incomplete (I) will only be given in very unusual
circumstances. The University regulations on incomplete grades state: “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than the lack of time”. Students are expected to take ALL tests, quizzes, exams, etc., and to complete and hand in all labs and other assignments. There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

9. All University rules, regulations and expected student conduct apply to this course. Students are held responsible for the information given in the current Catalog and Student Handbook. Make yourself aware of the University security regulations.

10. All labs, assignments, etc. must be handed in on the assigned due date. Scholars having problems must notify the instructor well before the due date. Marks will be deducted for poor and sloppily presented work.

11. Labs, etc. handed in after the due date may be subject to a penalty of loss of marks. Labs, etc. handed in after the graded labs, etc. have been returned to students will get zero marks but must be handed in to the instructor. Labs will be returned to students, after they have been graded, at a class meeting. Students who miss this meeting will be able to collect graded work in the marked box outside the instructor’s office.

12. Scholars are asked to take special note of the penalties, which the University attaches to Academic Dishonesty. Consult the Student Handbook.

13. All work handed in to the instructor must be the student's own work. Extracts, excerpts, etc. from the work of others must be suitably noted, acknowledged and properly referenced. Any Group Work will be judged in the same way. That is, it is the work of the group and the extracts, excerpts, etc. of others must be acknowledged.

14. All written and graphical work handed in must be presented neatly printed and bound (staples are adequate). Students’ written work will be judged on written communication skills, critical thinking and problem solving ability.

15. Students are expected to be present at all meetings (lectures, labs, etc.) of the class. Students are expected to be present at the date and time assigned for all tests, exams, quizzes, etc. There are NO provisions for making up missed exams except in cases where prior arrangements have been made and agreed to by the instructor. During the assigned lab session, ONLY assigned labs are to be done. All other work must be done in other rooms.

16. All cellular phones and other similar devices MUST BE TURNED OFF during lectures, labs and other class meetings.

17. All students must keep their university e-mail addresses (firstnamefirstletterlastname@islander.tamucc.edu). This will be the means of communication between the instructor and the class.

18. The instructor reserves the right to make changes to the above with due notice to the students. These changes will be announced in class and each student is responsible for keeping herself/himself informed of such changes.