GEOSPATIAL MATHMATICAL TECHNIQUES (GISC 3300)
Department of Geographic Information Sciences
Fall 2017

A. COURSE INFORMATION
Course number/section: GISC 3300.001 & W01
Class meeting time: M/W/F 11am – 11:50am
Class location: CS 101
Course Website: http://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
Instructor: Dr. Tony Nettleman, PSM, Esq.
Office location: CBI 105
Office hours: M/W (8am to 9am & 10am – 11am); Th (4:30pm to 5:30pm)
Telephone: (361) 825-3419 (office) or (404) 539-3050 (cell)
e-mail: Charles.Nettleman@tamucc.edu
Appointments: Please e-mail for appointments

C. COURSE DESCRIPTION
Characteristics of geographic information; overview of relevant sections of numbers, algebra and geometry; plane and spherical trigonometry; matrices, determinants and vectors; curves and surfaces; coordinate transformations; overview of basic statistics; best-fit solutions.

D. PREREQUISITES AND COREQUISITES
Math 2413 and Math 2414

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
“Adjustment Computations” by Chuck Ghilani

Supplies
None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
By the end of this course, students should be able to:
1. Understand how algebra and geometry are applied to GIS and geomatics
2. Understand the basic principles of plane and spherical trigonometry
3. Be able perform coordinate transformations using manual and computer-based methods
4. Understand basic statistics as applied to GIS problems

G. INSTRUCTIONAL METHODS AND ACTIVITIES
Students will be introduced to one module per semester. Each module contains two lectures, a skill check (short quiz), outside resources (YouTube videos, websites, etc), and a homework.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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</thead>
<tbody>
<tr>
<td>Quizzes (3 @ 167)</td>
<td>50%</td>
</tr>
<tr>
<td>Attendance and Participation (100)</td>
<td>10%</td>
</tr>
<tr>
<td>Homework (10 @ 40)</td>
<td>40%</td>
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</tbody>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (WEEKLY)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Intro and Welcome</td>
<td>N/A</td>
<td></td>
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<tr>
<td></td>
<td><strong>Module I: Math Concepts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Basic Math</td>
<td>N/A</td>
<td>Homework</td>
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<tr>
<td>3</td>
<td>Trig</td>
<td>N/A</td>
<td></td>
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<tr>
<td>4</td>
<td>Matrices</td>
<td>Adjustments App. A</td>
<td>Homework</td>
</tr>
<tr>
<td>5</td>
<td>Derivatives and Partial Derivatives</td>
<td></td>
<td>Quiz I</td>
</tr>
<tr>
<td></td>
<td><strong>Module II: Statistics</strong></td>
<td></td>
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<tr>
<td>6</td>
<td>Random Errors</td>
<td>Adjustments 3</td>
<td>Homework</td>
</tr>
<tr>
<td>7</td>
<td>Confidence Intervals</td>
<td>Adjustments 4</td>
<td>Homework</td>
</tr>
<tr>
<td>8</td>
<td>Hypothesis Testing</td>
<td>Adjustments 5</td>
<td>Homework</td>
</tr>
<tr>
<td>9</td>
<td>Weights of Observations</td>
<td>Adjustments 10</td>
<td>Homework</td>
</tr>
<tr>
<td>10</td>
<td>Intro to Least Squares</td>
<td>Adjustments 11</td>
<td>Homework</td>
</tr>
<tr>
<td>11</td>
<td>Blunder Detection</td>
<td>Adjustments 21</td>
<td>Homework Quiz II</td>
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<tr>
<td></td>
<td><strong>Module III: Math in Geomatics</strong></td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>Differential Leveling Adjustments</td>
<td>Elem. 4 + Adjustments 12</td>
<td>Homework</td>
</tr>
<tr>
<td>13</td>
<td>Traverse Adjustments</td>
<td>Elem. 9 + Adjustments 16</td>
<td>Homework</td>
</tr>
<tr>
<td>14</td>
<td>GNSS Adjustments</td>
<td>Adjustments 17</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Coordinate Transformations</td>
<td>Adjustments 18</td>
<td>Quiz III</td>
</tr>
</tbody>
</table>
Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor.

The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
If a student fails to attend more than three classes, the professor reserves the right to give the student an administrative “F”.

Late Work and Make-up Exams
No late work accepted without a serious/valid excuse

Extra Credit
No Extra Credit

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F. ANY STUDENT WITH THREE OR MORE UNEXCUSED ABSENCES MAY BE DROPPED FROM THIS CLASS WITHOUT NOTICE.

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- Classroom/Professional Behavior
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.
Statement of Civility
Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

Deadline for Dropping a Course with a Grade of W (University)
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

Grade Appeals (College of Science and Engineering)
As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, 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 Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

Disability Services
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 (361) 825-5816 or
visit Disability Services in Corpus Christi Hall 116.

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.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an 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. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.

**ONLINE EXAM PROCTORING**

For students taking the course online, you will take your tests remotely and they will be proctored by a service called Examity®. To use Examity®, you will need to make sure you meet the following technical requirements, in addition to the technical requirements set forth elsewhere in this syllabus:

- You must take your exam on a computer with a webcam and a microphone (both built-in and external are fine.)
• You must take your exam from a location that has sufficient internet speed: at least 700KBPS upload and download speed. You can test your internet speed at http://www.speedtest.net.

If you have any questions or concerns, you can contact Examity’s technical support team 24/7 via email at support@examity.com or phone at (855)-392-6489.

Examity involves third party charges. Exam-proctoring charges may range from $3 - $31.50 per exam. Students may be required to schedule exams at least 24 hours in advance or incur late scheduling charges. All costs for exams are the responsibility of the student. Students will also be responsible for providing webcams to be used in test proctoring.