I. COURSE INFORMATION

COURSE NAME: GISC 3300.001/W01: Geospatial Mathematical Techniques
LECTURE TIMES: MW 11:00 AM - 12:15 PM
LECTURE LOCATION: Blucher 104 and online
COURSE WEBSITE: BlackBoard at: https://bb9.tamucc.edu/
                  The Island Online (IOL) at: http://iol.tamucc.edu

INSTRUCTOR: Dr. Hongzhi Song
            Office: NRC 2100
            Email: Hongzhi.Song@tamucc.edu

OFFICE HOURS: MW 1:20 - 2:20 PM, T 2:00 – 4:00 PM, or, by appointment.

II. 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.

III. PREREQUISITES FOR THE COURSE

MATH 2413 AND MATH 2414

IV. TEXT


V. LEARNING OBJECTIVES

1. Understand basic concepts of geographic information
2. Understand how algebra and geometry are applied to GIS
3. Understand the basic principles of plane and spherical trigonometry
4. Understand the basic concepts of coordinate transformations
5. Understand basic statistics as applied to GIS problems

VI. COURSE REQUIREMENTS

Course requirements include the following:
1. Attendance at lecture and participation in class discussion.
2. Completion and hand in of assignments by the due dates.
3. Completion of exam by the scheduled due date.
4. DUE DATES:
   All assignments must be completed on time. Submission of an assignment after the due date is accepted, but with a penalty of 20% of the grade for the first 24 hours late, and 10% each additional 24 hours.
5. NOTE TO ONLINE STUDENTS:
Lecture notes will be made available online via BlackBoard (BB). It is your responsibility to read notes in every week so you stay up with the course.

VII. EVALUATION AND GRADING POLICIES

1. Assignments: 45%
2. Exams: 30%
3. Final Comprehensive Exam: 20%
4. Attendance: 5%
   TOTAL: 100%


VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Characteristics of Geographic Information</td>
</tr>
<tr>
<td>2</td>
<td>Numbers and Numerical Analysis</td>
</tr>
<tr>
<td>3</td>
<td>Algebra: Treating Numbers as Symbols</td>
</tr>
<tr>
<td>4</td>
<td>The Geometry of Common Shapes</td>
</tr>
<tr>
<td>5</td>
<td>Plane and Spherical Trigonometry</td>
</tr>
<tr>
<td>6</td>
<td>Differential and Integral Calculus</td>
</tr>
<tr>
<td>7</td>
<td>Matrices and Determinants</td>
</tr>
<tr>
<td>8</td>
<td>Vectors</td>
</tr>
<tr>
<td>9</td>
<td>Curves and Surfaces</td>
</tr>
<tr>
<td>10</td>
<td>Transformations</td>
</tr>
<tr>
<td>11</td>
<td>Map Projections</td>
</tr>
<tr>
<td>12</td>
<td>Basic Statistics</td>
</tr>
<tr>
<td>13</td>
<td>Correlation and Regression</td>
</tr>
<tr>
<td>14</td>
<td>Best-Fit Solutions</td>
</tr>
<tr>
<td>15</td>
<td>Final</td>
</tr>
</tbody>
</table>

Note: This course outline is a general plan for the course; deviations announced to the class by the Instructor may be necessary. The assignments that are given are related to Student Learning Outcomes stated above.

IX. ADDITIONAL POLICIES AND INFORMATION:

Email:
Consider email as official correspondence warranting professional language. Professional emails include elements such as a short descriptive subject line, salutation, complete inquiry in the body of the message, your full name, and course and section number. Unprofessional emails will result in a non-response and request for proper correspondence.

Prior Learning and Lecture Slides:
The professor will assume that prior to class you have made an earnest effort to understand the material. This will allow you to be prepared to engage the material in more detail or address misunderstandings in class. The slides in class are primarily for visual learners who need to both hear words and see text as
they are learning. They are not meant for students to copy as a substitute for prior studying and learning. As such, students should not frantically try to write down everything from the lecture slides. Lecture is simply another time and place to encounter the material again since repeat exposure helps with memory and understanding. As such, your in-class lecture notes do not need to be extremely lengthy. Additionally, please pay attention to what is not on the slides, that is, the extra examples and vocabulary the professor mentions that are related to the slides.

**Technological Excuses:**
Hard drive crashes and other computer woes will not be accepted as excuses for late submission. Students should, given the complexity of the tasks they will pursue, be sure that they maintain adequate backup copies of all aspects of their work. Additionally, plan ahead so that you will have time to use the on-campus computers and printers if necessary. You may NOT submit papers/assignments by e-mail. If for some reason you feel you have to do this, you must ask for, and receive, permission ahead of time; furthermore, you may not consider an e-mailed paper/assignment to be submitted until you have received a reply confirming that I have received the paper/assignment.

**Communication about Life Events:**
It is the your (student’s) responsibility to keep up with the course instruction, assignments, and examinations. Should a life event interrupt your ability to meet these responsibilities, you must inform the instructor about this as soon as possible and within a reasonable amount of time so that a course of action can be determined. Communicating with the instructor about these life events in an unreasonable time frame is not acceptable and will not change the outcome of missed work nor will it be a valid reason to receive an ‘Incomplete’ designation for the course.

**Academic Integrity/Plagiarism**
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 include, but not be limited to a grade of zero for the assignment, and referral to the office of academic affairs.

**Dropping a Class**
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 me before you decide to drop to be sure it is the best thing to do. 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. Refer to the University’s official academic calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) to determine the last day to drop a class with an automatic grade of “W” this term.

**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.

**Grade Appeals (College of Science and Engineering Version)**

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](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage ([http://sci.tamucc.edu/students/GradeAppeal.html](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.

**Disabilities Accommodations**

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 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.

**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.
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 65% 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 during the instructor’s office hours or next class meeting.

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. 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.