Applied Modeling Math 4385-001
Department of Mathematics and Statistics
Spring 2016

A. COURSE INFORMATION

Course number/section: Math 4385-001
Class meeting time: MW 7:00-8:15 PM
Class location: CI 107
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Dr. Aubrey Rhoden
Office location: CI 213B
Office hours: 12-2 pm TWR
Telephone: 316-825-3445
e-mail: aubrey.rhoden@tamucc.edu
Appointments: Appointments outside of office hours are available by request

C. COURSE DESCRIPTION

Catalog Course Description
Capstone course for mathematics majors. The construction of mathematical models from areas such as economics, refining, biology and mariculture, etc. Where possible, local phenomena will be modeled with the assistance of outside consultants.

D. PREREQUISITES FOR THE COURSE

Prerequisites
Prerequisites: MATH 3315, MATH 3342, and completion of at least 90 hours.

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s) or Other References
none

Supplies
Paper and pen or pencil
F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the courses student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Apply mathematical modeling strategies to solve typical application problems in the physical, social, life, information, and engineering sciences.

2. Effectively analyze and evaluate the quality of mathematical models and model-based interpretations.

3. Find and synthesize connections within and across secondary and undergraduate mathematics content.

4. Use modern computing software as a tool for visualization, simulation, and analysis of mathematical models.

5. Effectively communicate mathematical modeling processes and outcomes using both written and oral form.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

The course will be a combination of instructional presentation of new content, whole-class discussion, individual investigations of mathematics, online and computer-based explorations, and collaborative projects among students. Students will be required to give in-class presentations and prepare written reports. Students are expected to actively engage in all class components by attending class meetings, contributing ideas and providing constructive feedback on others work.

H. MAJOR COURSE REQUIREMENTS AND GRADING
<table>
<thead>
<tr>
<th>Component</th>
<th>Student Learning Outcome</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework &amp; Classwork</td>
<td>1,2,3,4,5</td>
<td>15%</td>
</tr>
<tr>
<td>Project</td>
<td>1,2,3,4,5</td>
<td>50%</td>
</tr>
<tr>
<td>Occasional Quizzes</td>
<td>1,3,4</td>
<td>10%</td>
</tr>
<tr>
<td>Major Field Test</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>2,5</td>
<td>15%</td>
</tr>
</tbody>
</table>

I. COURSE CONTENT/SCHEDULE

**Important dates:**
- January 18: Martin Luther King, Jr. Holiday
- January 20: Classes Begin
- January 27: Last Day to Late Register
- March 14-18: Spring Break
- April 8: Last Day to Drop
- May 3: Last Day of Classes
- May 11: Final Exam 7:15-9:45 pm

**Tentative Schedule:**
- Jan. 20 Week 1: Syllabus and project discussion
- Jan. 25 Week 2: Project selection and discussion
- Feb. 1 Week 3: Research
- Feb. 8 Week 4: Research and presentation
- Feb. 15 Week 5: Research
- Feb. 22 Week 6: Research and presentation
- Feb. 29 Week 7: Research
- Mar. 7 Week 8: Preliminary report due
- Mar. 14 Week 9: Spring Break
- Mar. 21 Week 10: Research
- Mar. 28 Week 11: Research and presentation
- Apr. 4 Week 12: Research
- Apr. 11 Week 13: Research and presentation
- Apr. 18 Week 14: Research
- Apr. 25 Week 15: Research and presentation
- May 2 Week 16: Final report due
- May 10 Week 17: Final exam

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**
Attendance for this course is required.
Late Work and Make-up Exams
Late work is not accepted unless previously approved. In the event of an excused absence for an exam, it is the student’s responsibility to arrange for a time to make up the exam as soon as possible.

Extra Credit
Extra credit will be given on some assignments for completing advanced problems, but there will be no extra credit assignments given to students on an individual basis to improve a grade.

Cell Phone Use
Cell phone use is not allowed during class

Laptop Use
Laptop or tablet use is not allowed during class.

Food in Class
Food is not allowed in the classroom.

Missed Exam
All absences from class or exams will be considered unexcused unless they are documented in advance as excusable with the instructor or as soon as possible in the case of emergencies. No credit will be awarded for work missed resulting from unexcused absences.

Participation
Participation in class discussion is important, and students that actively participate generally gain a better understanding of the material.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Honesty:**
  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, forgery, or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.)
  For the complete statement, see
  http://catalog.tamucc.edu/content.php?catoid=10&navoid=313%23Academic_Integrity#Academic_Honesty

- **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 instructors 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)** The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar at 
  [http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)
  for the last day to drop a course.

• **Grade Appeals 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 
  and the College of Science and Engineering Grade Appeals webpage at 
  [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.

- 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.

- Notice to Veterans
  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.

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.