NUMERICAL METHODS COSC 3385.001
School of Engineering and Computing Sciences
Fall 2019

A. COURSE INFORMATION

Course number/section: COSC 3385.001
Class meeting time: TR 8:00 a.m. - 9:15 a.m.
Class location: CI - 108
Course Website: bb9.tamucc.edu (Blackboard website)

B. INSTRUCTOR INFORMATION

Instructor: Agatha Owora
Office location: EN 316M
Office hours: TR 2:30 p.m. - 5:00 p.m.
Telephone: (361) 825-3688
E-mail: agatha.owora@tamucc.edu
Appointments: Please email for appointments

C. COURSE DESCRIPTION

Catalog Description
This course introduces concepts for solving problems numerically using computers. Students will learn about number systems, errors of finite representation, and iteration. A survey of basic numerical methods including: solutions to nonlinear equations, solutions to linear systems, approximation, interpolation, zeros of functions, numerical differentiation and integration, and Monte-Carlo methods.

Extended Course Description
None

D. PREREQUISITES AND COREQUISITES

Prerequisites
Math 2413 - Calculus I
COSC 1330 - Programming for Scientists, Engineers, and Mathematicians OR
COSC 1435 - Introduction to Problem Solving with Computers I

Recommended
MATH 2414 - Calculus II, MATH 3311 - Linear Algebra,

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
Optional Textbook(s) or Other References
None

Supplies
None

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 course’s 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. Understand the need for numerical methods and their application in different fields.
2. Apply the rules of differentiation to differentiate functions.
3. Use various methods to solve nonlinear equations.
4. Use various methods to solve linear equations.
5. Apply estimation techniques using interpolation.
6. Explain the various aspects of linear regression.
7. Use various methods to solve problems that require integration techniques.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Instructions will be delivered through in-class lectures, power point presentations, video lectures, and documents uploaded to Blackboard. Students are expected to go through the material on Blackboard before coming to class for the lecture.

H. MAJOR COURSE REQUIREMENTS AND GRADING

You will be given 7 quizzes and 2 exams. The details and due dates of the quizzes and exams will be available in Blackboard.

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<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exams</td>
<td>50%</td>
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<td>Quizzes</td>
<td>50%</td>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>- Introduction to Scientific Computing</td>
<td>Chapter 1</td>
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<tr>
<td>Week 2</td>
<td>- Introduction to Scientific Computing</td>
<td>Chapter 1</td>
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<tr>
<td>Week 3</td>
<td>- Differentiation</td>
<td>Chapter 4</td>
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<td>Week 4</td>
<td>- Differentiation</td>
<td>Chapter 4</td>
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<tr>
<td>Week 5</td>
<td>- Nonlinear Equations</td>
<td>Chapter 3</td>
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<tr>
<td>Week 6</td>
<td>- Nonlinear Equations</td>
<td>Chapter 3</td>
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<td>Week 7</td>
<td>- Exam One (Midterm)</td>
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<td>Week 8</td>
<td>- Simultaneous Linear Equations</td>
<td>Chapter 2</td>
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<tr>
<td>Week 9</td>
<td>- Simultaneous Linear Equations</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>Week 10</td>
<td>- Interpolation</td>
<td>Chapter 6</td>
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<tr>
<td>Week 11</td>
<td>- Interpolation</td>
<td>Chapter 6</td>
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<tr>
<td>Week 12</td>
<td>- Regression</td>
<td>Chapter 9</td>
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<tr>
<td>Week 13</td>
<td>- Regression</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>Week 14</td>
<td>- Integration</td>
<td>Chapter 5</td>
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<tr>
<td>Week 15</td>
<td>- Integration</td>
<td>Chapter 5</td>
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Exam Two (Final) – Refer to the university final exams schedule

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor.
J. **COURSE POLICIES**

**Academic Honesty Policy:** You are expected to avoid all forms of academic dishonesty as defined in the university Catalog. If you feel uncertain about a particular activity, please speak to me before problems arise. All work submitted for grading must be the student's own work. It is the student's duty to allow no one to copy his or her work.

**Attendance:** You are responsible for any materials covered or handed out, or announcements made for the quizzes, exams, and assignments in your absence. Records of your attendance will be maintained and reported to the university.

**Late Assignments and Makeup Quizzes/Exams:** Late assignments will receive a grade of 0. No extra or make up assignments will be available. In the event that you cannot attend the class to take the quiz/exam due to some emergency or some unavoidable situation you must notify me as soon as possible before the quiz/exam. Valid documentation is required for one to receive a makeup quiz/exam.

**Food in Class:** No food is allowed in class. A closed lid drink is allowed if the lecture is not being held in the computer labs.

**Technology Use:** Cell phones and pagers must be on silent mode. Laptops and tablets can be used in the class for note taking and reviewing slides.

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/](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.C0.03, Student Grade Appeal, 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.C0.03, Student Grade Appeal. These documents are accessible through the University Rules website at [http://academicaffairs.tamucc.edu/rules_procedures/](http://academicaffairs.tamucc.edu/rules_procedures/), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/documents/forms/FacultyHandbook.pdf#College%20of%20Science%20and%20Engineering%20Faculty%20Handbook](http://sci.tamucc.edu/documents/forms/FacultyHandbook.pdf#College%20of%20Science%20and%20Engineering%20Faculty%20Handbook). 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.