THE UNIVERSITY OF TEXAS AT AUSTIN
Department of Aerospace Engineering and Engineering Mechanics

COE 301 Introduction to Computer Programming
Spring, 2022

SYLLABUS

Unique Number: 14605

Instructor: Renato Zanetti
renato@utexas.edu
Office hours: TBD (virtual)

Lecture Time: MWF 9 am – 9:50 am

Location: ASE 1.126

Teaching Assistant: Kristen Michaelson, kmichaelson@utexas.edu
Corinne Vassallo, corinne.vassallo@utexas.edu

Web Page:
Information about the course, such as the syllabus, homework assignments, handouts, and homework solutions, will be posted regularly on Canvas (*http://canvas.utexas.edu*). You will also be able to monitor your progress in the course by reviewing your assignment/exam grades.

Catalog Description:
Development of structured solutions to engineering and mathematical problems and an understanding of coding practices. Programming in C++ and MATLAB.

Course Objectives:
The primary objective of this course is to learn basic computer programming concepts and apply them to engineering computations.

Prerequisites: No prerequisites are required, although some knowledge of calculus and linear algebra is useful.

Knowledge, Skills, and Abilities Students Gain from this Course (Learning Outcomes):
By the end of the course, you should be able to think in a structured manner about solutions to engineering/mathematical problems using C++ and MATLAB.

Impact on Subsequent Courses in Curriculum:
COE 301 is a prerequisite for COE 311K, Engineering Computation and COE 322, Scientific Computation.

Relationship of Course to Program Outcomes:

This course contributes to the ABET Criterion 3 student outcomes listed below. For more information, see *Criteria for Accrediting Engineering Programs, 2021-2022* at https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2021-2022/.

STUDENT OUTCOME	
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	√
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. an ability to communicate effectively with a range of audiences	
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	√
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	√

Aerospace Engineering ABET Program Criteria Achieved:

Criterion	√	Criterion	√	Criterion	√
A. Aerodynamics		G. Orbital Mechanics		M. Preliminary/Conceptual Design	
B. Aerospace Materials		H. Space Environment		N. Other Design Content	
C. Structures		I. Attitude Determination and Control		O. Professionalism	
D. Propulsion		J. Telecommunications		P. Computer Usage	√
E. Flight Mechanics		K. Space Structures			
F. Stability and Control		L. Rocket Propulsion			

Topics:

The following is a tentative outline of the topics to be covered.

- Introduction to computers – operating systems
- C++ Programming: overview of C++; data types; syntax rules; arithmetic operations; sequence, conditionals, repetition; flow control; functions; arrays; pointers; dynamic memory allocation, file processing; etc.
- MATLAB: M-files; file processing; control statements; vector and matrix operations; plotting; functions; MATLAB ODE solvers; linear systems and its applications; etc.

Textbooks:

There is no textbook required for COE301. Lecture slides will be made available before the lecture.

Computer:
Homework will include programming assignments to be completed on a computer. A C++ compiler and MATLAB will be used for all assignments. We will provide detailed information on how to install software required to complete your homework in the course handouts. You can get additional help through our office hours.

Class Format:
Three lecture hours a week for one semester. You may attend the lecture in person or through zoom. The live lectures will be recorded.

Class Schedule:
We will spend ~ 8 weeks on C++ and ~ 6 weeks on MATLAB.

The midterm exam will be during class time on Wednesday, March 30th.

The final exam will be administered during the UT assigned time for our class.

Grading:
Homework   30 %
Midterm   30 %
Final   40 %

Letter grades will be assigned as follows:

Grade	Cutoff
A	90
A-	87
B+	84
B	80
B-	77
C+	74
C	70
C-	67
D	57
F	<57

Homework Policy:
Assignments will be given, on average, every week. There will be ~12 total assignment. Assignments will be due at 11:59 pm on the date marked on the assignment sheet, unless modified by the instructor. Late assignments will be penalized by 33 points per day. No late homework will be accepted 3 days after the due date.

Students are strongly encouraged to discuss course topics with each other, since such discussions are an important part of the learning process. However, each student must carry out assignments independently. All assignments in this course may be processed by TurnItIn, a tool that compares submitted material to an archived database of published work to check for potential plagiarism. Other methods may also be used to determine if the homework is the student's original work. Regardless of the results of any TurnItIn submission, the faculty member will make the final determination as to whether or not a homework set has been plagiarized.

Examinations:
There will be **two** open-notes exams. The final exam date and time will follow the university schedule. The mid-term exam (one hour) is scheduled on March 30 in class. You must take the exam in person.

Attendance:
We expect students to attend the lectures in person or via zoom. Lecture recordings will be available to students.

Important Dates:
Please refer to UT academic calendar 2021-2022:
https://registrar.utexas.edu/calendars/21-22

Academic Integrity:
Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity." **Plagiarism is taken very seriously at UT.** Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Otherwise you will be guilty of plagiarism and subject to academic disciplinary action, including failure of the course. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: http://deanofstudents.utexas.edu/sjs/acint_student.php

Services for Students with Disabilities:
This class respects and welcomes students of all backgrounds, identities, and abilities. The University of Texas at Austin provides upon request appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TDD or the Cockrell School of Engineering Director of Students with Disabilities at 471-4321.

Title IX Disclosures:
Beginning January 1, 2020, Texas Senate Bill 212 requires all employees of Texas universities, including faculty, report any information to the Title IX Office regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or one-on-one conversations) must be reported. If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit http://www.titleix.utexas.edu/,contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419.

Although graduate teaching and research assistants are not subject to Texas Senate Bill 212, they are still mandatory reporters under Federal Title IX laws and are required to report a wide range of behaviors we refer to as sexual misconduct, including the types of sexual misconduct covered under Texas Senate Bill 212.The Title IX office has developed supportive ways to respond to a survivor and compiled campus resources to support survivors.

Evaluation:
The Measurement and Evaluation Center (MEC) forms for the Cockrell School of Engineering will be used during the last week of class to evaluate the course and the instructor. Students are strongly encouraged to complete it.

Classroom Safety and COVID-19

To help preserve our in person learning environment, the university recommends the following.

- Adhere to university mask guidance.
- Vaccinations are widely available, free and not billed to health insurance. The vaccine will help protect against the transmission of the virus to others and reduce serious symptoms in those who are vaccinated.
- Proactive Community Testing remains an important part of the university's efforts to protect our community. Tests are fast and free.
- Visit utexas.edu for more information.

Sharing of Course Materials is Prohibited

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, homework and their solutions, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have my explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. I am well aware of the websites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.

Class Recordings

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings. Guidance on public access to class recordings can be found here.

Prepared by: Renato Zanetti   Date: 01/14/2022