ENGR 102 – FALL 2021
Sections: 469, 470, 472, 569, 570, 571, 572
ENGINEERING LAB I: COMPUTATION

Instructor Information:

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Course Description and Prerequisites

Catalog Description: Introduction to the design and development of computer applications for engineers; computation to enhance problem solving abilities; basic concepts of software design through the implementation and debugging of student-written programs; introduction to engineering majors, career exploration, engineering practice within realistic constraints, e.g. economic, environmental, ethical, health and safety, and sustainability; pathways to success in engineering. 2 credit hours.

Prerequisites: C or better in MATH 150 or 151 or concurrent enrollment; admission to the college of engineering.

This course provides an introduction into the design and development of computer applications for engineers. No prior experience in programming is necessary. Students will learn to use computation to enhance their problem solving abilities. The course will cover basic concepts of software design through the implementation and debugging of student-written programs. This course also introduces engineering majors that are available to students, types of work engineers in their field do, engineering practice within realistic constraints, e.g. economic, environmental, ethical, health and safety, and sustainability, and the paths to success in their chosen field.

Course Expectations:

You are expected to:

- **Always use your @tamu.edu e-mail account to send correspondence between yourself and the teaching team. Always include "ENGR102" + your section number in the subject line for all correspondence. Check your @tamu.edu email account daily.**
- Use your Canvas account (*http://canvas.tamu.edu/*) to access course information, assignments and your grades.
- Be an active problem solver, contributor, and discussant in class.
- Be prepared and accountable for class by reading the assigned material ahead of time and be able to answer simple questions over said material.
- Be held accountable for all assigned material that is, or is not, explicitly discussed in class.
- Have a public presence in the class.
- Attend class as a community expectation.

Learning Outcomes or Course Objectives

Upon successful completion of this course, students will be able to:

- Demonstrate the use of basic programming techniques in the construction of computer programs, including techniques to:
  - Collect, store, and manipulate data within a computer program
  - Collect, create, store, and manipulate data in larger structures such as arrays, matrices, and lists
  - Use control structures, such as conditionals and loops, in computer programs
  - Declare and use functions to solve computing-related problems
  - Analyze data from a file and output processed results to a file
  - Decompose a complicated task into more manageable pieces
- Apply programming techniques to solve problems in engineering, including
  - Applying vector and matrix manipulation of data to solve engineering problems
  - Graphically plotting data to visualize data and modeling concepts
  - Manipulating data to numerically calculate derivatives in the context of engineering applications
  - Applying conditionals and loops to implement numerical methods, such as bisection and Newton's method
- Complete a team programming assignment that ties together concepts learned in the class
- Complete the required homework assignments for introduction to engineering majors, engineering practice, and student success

Textbook and/or Resource Material

The course has one required textbook:

Programming in Python - Publisher: Zybooks

Important! – This is an electronic book. You can purchase an access code either at the bookstore, or online through the course Canvas web site. Do not buy at both the bookstore and online!

It is not recommended to purchase a book and code package from other retailers, since their codes will not give you proper access to the publisher's online materials.

Other Required Materials/Supplies:

1. Your BYO computer. You should have the required course software (Microsoft Office, Anaconda, PyCharm or Spyder, and Python 3) installed. Microsoft Office is available from TAMU Software. Python 3 et al. will be installed in class.
2. Your required smartphone. Your cellphone may not be used as a calculator during exams.
3. Access to your TAMU Google Drive. This is a free service arranged by TAMU, and will make teamwork much easier.
4. A Scientific Calculator. The calculator can have as many features as you deem necessary. However, please note that for exams you will only be able to use the calculator's addition, subtraction, multiplication, division, logarithmic and trigonometric functions capabilities. Any other capabilities of your calculator will specifically be forbidden from being used.

Grading Policies

- Exam 1 (20%) – 1 hour and 50 minute midterm exam
- Exam 2 (25%) – 1 hour and 50 minute comprehensive second exam
- Classwork & Homework (44%) – You will have a variety of assignments throughout the term. Lab assignments will be assigned weekly and are designed to help students understand the course material, provide practical programming experience, and help improve problem-solving abilities. Labs will consist of both in-class activities and take-home assignments. While many assignments will be individual, some lab assignments will be done in teams. There will also be in-class quizzes consisting of questions concerning material in the lecture and lab assignments. The purpose of the quizzes is to help you stay caught up on the lecture material in the class as well as to test your understanding of the lab assignments.
- Department Module Homework assignments (8%) – Students must complete the assignments having to do with the introduction of the engineering disciplines & engineering practice, as well as the modules addressing student success.
- Industry Night Essay and DI Saturday Essays (3%) - You will be required to attend 1 Industry Night Seminar during the term. These are informational events featuring different companies that hire engineering graduates. Information on dates and companies will be forthcoming. You will be required to attend 2 Department Information Presentations on **Saturday, October 16th**. For all of these events you will need to submit a short (250 word) essay indicating you attended and paid attention. More details on Industry Nights and DI Saturday will be forthcoming.

The following grading scale will be used to determine your semester course grade:

$$100 \geq A \geq 90\% > B \geq 80\% > C \geq 70\% > D \geq 60\% > F$$

Other Pertinent Course Information

Languages: The primary language used in this course will be Python 3. Supplementary material will be provided to demonstrate how concepts can be realized in Excel.

Introduction to Majors: Information modules on the departments and majors of the college will be presented at various points of the term. The weeks during which these modules are made available have been coordinated with other activities the departments have planned. The goal of these modules is to improve student understanding of the breadth of engineering disciplines to aid in their selection of a major and to introduce the practice of engineering.

Course Topics, Calendar of Activities, Major Assignment Dates (dates may be changed due to exigent circumstances)

Week	Class Topics	Assignments	Featured Departments	Engineering Module
1 (8/30-9/3)	Introduction to Course, Engineering, and Programming	Lab 1a, 1b		
2 (9/6-9/10)	Variables, Assignment, Sequential Steps	Lab 2a, 2b	BAEN & ISEN	Engineering Success
3 (9/13-9/17)	Data Types, Input, Basic Functions	Lab 3a, 3b		Academic Honesty (1)
4 (9/20-9/24)	Boolean Expressions, Conditionals	Lab 4a, 4b	CVEN & EVEN	Fischer Design Center
5 (9/27-10/1)	Creating and Testing Programs, Basic Debugging	Lab 5a, 5b	MEEN & AERO	Academic Honesty (2)
6 (10/4-10/8)	Loops and Iteration	Lab 6a, 6b		
7 (10/11-10/15)	Lists of Data (last topic on Midterm)	Lab 7a, 7b	ETID & MSEN	
8 (10/18-10/22)	Top-Down Design of Programs	Lab 8, **Exam 1 during second class of week**	OCEN, ITDE, & AREN	
9 (10/25-10/29)	Systematic Debugging			Student Counseling
10 (11/1-11/5)	File Input and Output	Lab 9a, 9b	CHEN & PETE	Global Program Opportunities
11 (11/8-11/12)	Using Engineering Modules in Python	Lab 10a, 10b	BMEN & NUEN	Zachry Leadership Program
12 (11/15-11/19)	Advanced Functions, Scope	Lab 11a, 11b	ECEN & CPSC	Entrepreneurship Program
13 (11/22-11/23 only)	Functions and use in top-down / bottom-up design (MT) NO CLASS (WRF)	Lab 12a, 12b		
14 (11/29-12/3)	Topic "Instructor's Choice"	Lab 13, **Exam 2 during second class of week**		ENGR[X]
15 (12/6-12/8)	Monday is Friday, Tuesday is Thursday			
Finals Week	NO FINAL			

IMPORTANT DATES:

August 30 – First day of fall semester classes.
September 3 – Last day (by 5 p.m.) for adding/dropping courses for the fall semester.
October 18 – Mid-semester grades due.
November 19 – Last day (by 5 p.m.) to drop courses with no penalty (Q-drop) or to officially withdraw from the University
November 24 – Reading day, no classes
November 25-26 – Thanksgiving Holiday
December 6 – A Monday, but students attend Friday classes
December 7 – A Tuesday, but students attend Thursday classes
December 8 – Last day of classes
December 10-15 – Final exams

Rules for Electronically-submitted work:

When submitting a file electronically via a Canvas or Mimir submission box, you are **required** to check that the file was uploaded successfully. This may be checked by trying to download the file that you just submitted. This helps prevent errors such as when students may inadvertently <Save> rather than <Submit> or submit a corrupted file. Work that was <Saved> but not <Submitted> cannot be accessed by the grading team and therefore will not be graded.

Late Policy

Late work is accepted, with a penalty. Late penalties may vary by assignment, but are typically 10% off per day. You may submit late work up to 7 days past the due date. Resubmissions after a grade has been assigned are NOT accepted. The late policy does not apply to in class quizzes and exams.

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage

in healthy self-care by utilizing available resources and services on your campus. Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

Campus Safety Measures

The Texas A&M University System and Texas A&M University have provided operating guidelines pertaining to faculty, staff, and students relative to the fall semester. Consistent with those guidelines, the College of Engineering and the Texas A&M Engineering Experiment Station will continue to be fully operational with facilities opened to 100% capacity and employees resuming normal on-site functionality and services. To help ensure that our campus community remains a healthy and safe environment for our employees and students, please be aware of the following:

- While the Texas A&M System **does not require** employees to be vaccinated or to wear masks, faculty, staff and students are **strongly encouraged** to keep Aggieland safe by getting vaccinated, wearing a mask while indoors and frequently washing hands.
- All students, staff and faculty **are required** to participate in **Texas A&M's mandatory COVID-19 testing program**. Everyone, regardless of vaccination status, will be required to submit to a COVID diagnostic test between **Aug. 23–Sept. 10, 2021**, provided by Texas A&M University.
- Students, faculty and staff who test positive for COVID-19, have COVID-19 symptoms or who have had close contact with someone who received a positive test result for COVID-19 are required to log on and complete the **COVID-19 Report Form** on this website, and are asked to cooperate with the Texas A&M COVID-19 Investigation Operations Center.
- Students, faculty and staff who test positive or have been identified as a close contact are required to quarantine/isolate consistent with **Centers for Disease Control and Prevention** guidance.
- **Students must confirm they've read and agree to adhere to the applicable guidelines by logging on through the Howdy Portal.**

The **Engineering COVID web pages** will be updated as additional information is made available or as conditions warrant changes.

Personal Illness and Quarantine

Students testing positive for COVID-19 and or required to quarantine should assess personal needs for missed classes or assignments, consult course syllabi and contact course instructor of record to coordinate arrangements, as appropriate. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or Illness that is too severe for the student to attend class qualify for an excused absence (See Student Rule 7, Section 7.2.2.) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7. While Student Rule 7, Section 7.3.2.1, indicates a medical confirmation note from the student's medical provider is preferred, **Students must submit the excused absence from class within two business days after the last date of absence.**

Please note that the extensive remote learning opportunities that were available last year will not be available as the semester starts.

If you must isolate or quarantine, you will need to contact your professors and make appropriate arrangements to complete assignments and stay current in your classes. Such arrangements are expected to be like those offered in the past for students who missed class due to illness or other urgent matters, per Student Rule 7.

Operational Details for Fall 2021 Courses

For additional information, please review the FAQ on Fall 2021 courses at Texas A&M University.

COVID Statement

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.