TEXAS A&M UNIVERSITY

ENGR 102 Syllabus

Course Information

Course Number and Sections: ENGR 102, Sections 520, 421/521, 522
Course Title: Engineering Lab I: Computation
Time and Location: 8:00 – 9:50 am (520), 10:20 am – 12:10 pm (421/521), 12:40 – 2:30 pm (522), ZACH 340 (Mondays) and ZACH 218 (Fridays)
Credit Hours: 2

Instructor Details

Instructor: S. Niki Ritchey, PhD, PE, Associate Professor of the Practice
Office: ZACH 424D
E-Mail: snritchey@tamu.edu
Office Hours: T 9:30 – 11 am via Zoom (https://tamu.zoom.us/j/93047401468), F 2:30 – 4 pm in ZACH 424D, or by appointment via Zoom (https://calendly.com/snritchey)

Course 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.

Course 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.

Special Course Designation

N/A

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" 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.

Course Learning Outcomes

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 Materials

The course has one required textbook: *ENGR 102: Engineering Lab I Computation* - 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. You must purchase the textbook in order to submit your lab assignments.

Other Required Materials/Supplies

1. Your BYO computer. You should have the required course software (Microsoft Office, Python 3 via Spyder or Anaconda and PyCharm) 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.

Other Pertinent Course Information

Languages: The primary language used in this course will be Python 3.
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.

Grading Policy

- Exam 1 (20%) – 110 minute in class midterm exam
- Exam 2 (25%) – 110 minute comprehensive second exam
- Lab Assignments (15%) – You will have a variety of assignments throughout the term, including lab assignments and in-class quizzes. Lab assignments will be assigned with each topic 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.
- Quizzes (29%) – 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 15th, 2022**. 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:

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

Rules for Electronically Submitted Work

When submitting a file electronically via a Canvas or zyBooks 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 Work 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.

Missed Class and Makeup Work Policy

Attendance in class is strongly recommended. Missed work may be made up if you have an excused absence as defined in Part I, Section 7 of the TAMU Student Rules or an unexcused absence approved by the instructor **before** missing class. In the case of an emergency, you must send notification as soon as possible. There will be no opportunity to make up missed work due to an unexcused absence that is not approved by the instructor. Missed work must be made up (or scheduled to make up) within one week of returning to class.

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

Module	Class Topics	Assignments	Featured Departments	Engineering Modules
1 (8/24-8/26)	1. Introduction to Course, Engineering, and Programming;	Topic 1 Lab		Academic Honesty (1)
2 (8/29-8/31)	2. Sequential Steps, Variables, Assignment	Topic 2 Labs	CHEN, NUEN	Student Counseling
3 (9/1-9/9) **No class 9/5**	3. Data Types, Input/Output, Basic Functions	Topic 3 Labs		Academic Honesty (2)
4 (9/12-9/16)	4. Boolean Expressions, Conditionals	Topic 4 Labs	MEEN, MSEN	
5 (9/19-9/23)	5. Creating and Testing Programs, Basic Debugging	Topic 5 Labs	CVEN, EVEN	Fischer Engineering Design Center
6 (9/26-9/30)	6. Loops and Iteration	Topic 6 Labs	BAEN, AERO	
7 (10/3-10/7)	7. Lists of Data (last topic on Exam 1)	Topic 7 Labs	ETID	
8 (10/10-10/14) **No class 10/10**	8. Top-Down Design of Programs	Topic 8 Labs		Global Program Opportunities
9 (10/17-10/25)	Review, Exam 1 9. Advanced Functions, Scope	**Exam 1 on 10/21** Topic 9 Labs		Zachry Leadership Program
10 (10/26-11/1)	10. Systematic Debugging	Topic 10 Labs	ISEN, PETE	
11 (11/2-11/8)	11. File Input and Output	Topic 11 Labs	OCEN, AREN	Entrepreneurship Program
12 (11/9-11/15)	12. Using Engineering Modules in Python	Topic 12 Labs	BMEN, ECEN	ENGR[X]
13 (11/16-11/22)	13. Functions and use in top-down / bottom-up design	Topic 13 Labs	CPSC, CPEN	
(11/23-11/29) **No class 11/25**	Review			
(11/30-12/7)	Exam 2 Instructor's Choice, Wednesday is Monday	**Exam 2 on 12/2**		
Finals Week (12/9-12/14)	NO FINAL			

Important Dates

August 24 – First day of fall semester classes
August 30 – Last day (by 5 p.m.) for adding/dropping courses for the fall semester
September 5 – Labor Day Holiday
October 10 – Mid-semester grades due
October 10-11 – Fall break, no classes
November 18 – Last day (by 5 p.m.) to drop courses with no penalty (Q-drop) or to officially withdraw from the University

November 23 – Reading day, no classes
November 24-25 – Thanksgiving Holiday
December 7 – A Wednesday, but students attend Monday classes
December 7 – Last day of fall semester classes
December 9, 12-14 – Final exams
December 19 – Final grades due

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).

Uploading of assignments and answers to, or downloading of answers from any online "study site" such as, but not limited to, Chegg, Course Hero, Quizlet, etc. is strictly prohibited and will be treated as cheating. You should not submit as your own work solutions produced by any paid tutoring service.

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 the Disability Resources office on your campus (resources listed below) 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, a person who is subjected to the alleged conduct 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.

Classroom Access and Inclusion Statement

Texas A&M University is committed to engaged student participation in all of its programs and courses and provides an accessible academic environment for all students. This means that our classrooms, our virtual spaces, our practices and our interactions are as inclusive as possible and we work to provide a welcoming instructional climate and equal learning opportunities for everyone. If you have an instructional need, please notify me as soon as possible.

The Aggie Core values of respect, excellence, leadership, loyalty, integrity and selfless service in addition to civility, and the ability to listen and to observe others are the foundation of a welcoming instructional climate. Active, thoughtful and respectful participation in all aspects of the course supports a more inclusive classroom environment as well as our mutual responsibilities to the campus community.

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to howdy.tamu.edu and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete FERPA Notice to Students and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.

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.