

Course Title: Computer Applications in Engineering

Course Prefix: ELEG

Course No.: 1043

Section No.:

Department of Electrical and Computer Engineering

Roy G. Perry College of Engineering

Instructor Name:

TBA

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Office Hours: *TBA*

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Course Location: *TBA*

Class Meeting Days & Times: *TBA*

Catalog Description: **ELEG 1043 – Computer Applications in Engineering. (2 – 2) Credit 3 semester hours. Fundamentals of C++ programming language and MATLAB application software. Logic of algorithms, flowcharts, program looping, conditional statements, arrays, functions and pointers, engineering applications and team projects.**

Prerequisites: MATH 1113 or (COSC 1300).

Co-requisites: MATH 1113

Recommended Text: Gary Bronson, C++ for Engineering and Scientists 3rd Edition, Thompson Learning

Recommended Text/Readings: Programming and Problem Solving with C++ by Nell Dale 4th Edition.

Access to Learning Resources: PVAMU Library:
phone: (936) 261-1500;
web: <http://www.tamu.edu/pvamu/library/>
University Bookstore:
phone: (936) 261-1990;
web: <https://www.bkstr.com/Home/10001-10734-1?demoKey=d>

Course Goals or Overview:

Course Goals: To provide students with a carefully paced introduction to the basics of C++ programming supplemented with the MATLAB software package in order to utilize MATLAB's extensive library of built-in functions and graphical capability. Students will develop programming skills to solve engineering problems through logically thinking through the given problems to arrive at clearly coded algorithms for the final solutions. Students will also develop skills to test solutions.

Course Outcomes/Objectives

At the end of this course, the students will be able:

- 1 to develop C++ programming skills to solve engineering problems through logically thinking through the problem to arrive at the clearly coded algorithm for the final solution;
- 2 to effectively use logic of algorithms, flowcharts, program looping, conditional statements, and team projects to visualize the steps in a logical sequence to solve engineering problems;
- 3 to engage in team projects which provide a forum to interact and share ideas or articulate positively the merit of alternative solutions in an earnest effort to complete assigned task on time;
- 4 to use the computer to process mathematical formulae and data for analysis and interpretation.

Course Assessments

(A) Critical Thinking:

Students will develop C++ programming skills to solve engineering problems through logically thinking through the problem to arrive at the clearly coded algorithm for the final solution.

Critical thinking is assessed through homework and exams that have problems related to flowcharting, program looping statements, and functions. An outcome rubric will be used for the assessment.

(B) Communication:

The course includes the coverage of logic of algorithms, flowcharting, programming looping, conditional statements, functions, and team projects that enable students to visualize the steps to effectively communicate among themselves and to use a computer to solve the problems.

Communication will be assessed through team project presentation, and tests that involve visual communication through flowcharting to solve engineering problems. A presentation rubric will be used for the assessment.

(C) Teamwork:

The course includes team project and presentation that provide students with a forum to interact contribute and share ideas with one another or articulate positively the merits of alternative solutions or courses of actions in an effort to complete the assigned tasks by a deadline.

Teamwork is assessed through peer-to-peer assessment of individual team work, fellow student's feedback, and faculty evaluation of functionality of the teams. An outcome rubric will be used for the assessment.

(D) Empirical and Quantitative Skills:

The course covers conditional statements, arrays, functions, engineering applications using computer to process mathematical formulae, manipulate and interpret data analysis, and interpretation.

Empirical and quantitative skills are assessed through assignment of problems that involve writing various algorithms to solve engineering problems and to test the validity of the final solution. An outcome rubric will be used for the assessment.

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Exams and Homework – tests and homework designed to measure knowledge of presented course material.

Team Projects – assignments designed to measure students' ability to work cohesively as a team and to apply presented course material in the computer lab.

Grading Matrix

Instrument	Value
Exams (3 exams; 15, 20, 15)	50
Homework, Team Project	20
Final Exam (Comprehensive)	30
Total	100

Grade Determination based on 600 points:

A = 90% or better

B = 80 – 89 %

C = 70 – 79 %

D = 60 – 69 %

F = Less than 60%

Course Procedures

Submission of Assignments:

All assignments should be submitted by the due date. Late assignments will not be accepted.

Formatting Documents:

Microsoft Word is the standard word processing tool used at PVAMU. If you're using other word processors, be sure to use the "save as" tool and save the document in either the Microsoft Word, Rich-Text, or plain text format.

Exam Policy

Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).

Semester Calendar

Week One	Overview of Programming and Problem Solving
Week Two	C++ Syntax and Semantics, and the Program Development Process
Week Three	Numeric Types, Expressions, Input and Output
Week Four	Logical Expressions, Conditional Statements – (Test 1)
Week Five	Program Looping,
Week Six	Arrays
Week Seven	Arrays, (Test 2)
Week Eight	Functions
Week Nine	Functions, Pointers
Week Ten	MATLAB Fundamentals, (Test 3)
Week Eleven	MATLAB Functions
Week Twelve	Plotting in MATLAB
Week Thirteen	MATLAB Applications
Week Fourteen	Team Project Presentations
Week Fifteen	Review, Final Exam

University Rules and Procedures

Disability statement (See Student Handbook):

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.