



DEPARTMENT OF SCIENCE

COURSE OUTLINE – WINTER 2020

EG1050 – ENGINEERING DESIGN – 3.8(3-0-1.5) UT 67.5 Hours 15 Weeks

INSTRUCTOR: Tanvir Sadiq, Ph.D., P.Eng.

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OFFICE: J 209

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OFFICE HOURS: TR 1000 – 1100 or by Appointment

DELIVERY MODE(S): Lectures, Seminars, Labs

PREREQUISITE(S)/COREQUISITE: None

REQUIRED TEXT/RESOURCE MATERIALS: (i) *Information on Required Text will be provided in class.* (ii) [MATLAB Primer](#) Latest Edition, Mathworks (Reference) (iii) [MATLAB® Student Version](#) (optional)

CALENDAR DESCRIPTION: 'Engineering science and design problem solving using MATLAB.'

LEARNING OUTCOMES: Upon successful completion, a student should be able to:

- Use MATLAB to perform a range of matrix and vector operations.
- Use MATLAB programs to solve mathematical models of engineering systems and/or components.
- Write short MATLAB programs to solve introductory level engineering/scientific problems.
- Use MATLAB to plot data and mathematical functions.
- Use MATLAB to solve systems of linear equations.
- Use MATLAB to perform least-squares fitting of a curve to data.
- Use MATLAB skills in the context of a design process which leads to a modeling tool useful for engineering analysis purposes.
- Prepare a report that describes a computer model (computer program) for solving an engineering/scientific problem, the purpose for the model, and its application.

COURSE OBJECTIVES: This course is designed to teach engineering students basic computer concepts and terminologies as well as to develop reasonable proficiency in MATLAB programming to solve engineering problems. A student is expected to design and develop several well-structured programs as solution to given assignments.

COURSE SCHEDULE/TENTATIVE TIMELINE:

This schedule is subject to change without notice at the discretion of the instructor.

Week	Subject	Assignment
1	Course outline -Introduction to course goals. Introduction - History of computers Using MATLAB, MATLAB Environment, Simple programs	No lab
2, 3	MATLAB Fundamentals –variables, workspace, operators, repetition, conditional programming, input/output	Assignment
4	Program Architecture, Design, Development. Built-in Functions	Assignment
5, 6	Logicals. Matrices & Arrays, Matrix Operations, Linear Equations. M-Files, Debugging M-files	Assignment
End of 6	MIDTERM EXAM	
7	Loops. Errors	Assignment
8	Graphics 2D, Graphics 3D	Assignment
9	Arrays & Structures, Cell Arrays, Sorting, Classes and Objects.	Assignment
10	Applications – Dynamical Systems	Assignment
11	Simulation	
12	Numerical Methods: Equations, Integration, Differentiation, ODE, PDE	
13	Syntheses of all we have learned. Review and preparation for the Cumulative Final Exam	No Lab

EVALUATIONS:

Assignments/Quizzes*	5%
Labs**	25% (Attendance Required)
Midterm	30% (1430 – 1550, Friday Feb 28, 2020)
Final Exam	40% (Time & Location TBA by Registrar’s office)

*Your final grade will be available through Student Services or on myGPRC portal. Grades/Marks will **NOT** be disclosed by email or phone and all such requests will be disregarded. Use of calculators is prohibited.*

* There will be a quiz based on assignment material on the assignment due date. Some quizzes may not be announced in advance. Missed quizzes cannot be made up. Minor (up to 10%) adjustments may be made to the weights of assignments and quizzes at the discretion of instructor.

** Lab marks include marks for attendance, Lab assignments, **Lab exams**, and a discretionary project. There is 10% penalty for each day an assignment or project is late. Late work will not be accepted after the submissions have been graded.

MIDTERM EXAMINATION MISSED FOR ANY REASON WILL NOT BE RESCHEDULED. Students not writing the midterm exam, with a valid excuse (as defined by the College policy) will have the midterm weight added to the final and/or lab exam. This is not automatic, and if you miss the midterm, you should follow all College guidelines and contact your instructor as soon as possible. Midterm will be from the material covered up to the end of 6th week. All exams will be closed-book, closed-notes and calculators will not be allowed.

Students are expected to attend all classes. If you miss a class, make arrangements to copy the notes from your class fellows. If you are using older edition of the textbook, you are responsible for matching page numbers, topics, figures, and problems with the editions being used in the class. You are encouraged to ask questions, but do not monopolize the class time.

GRADING CRITERIA: (The following is a general guideline only)

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100	C+	2.3	67-69.99
A	4.0	85-94.99	C	2.0	63-66.99
A-	3.7	80-84.99	C-	1.7	60-62.99
B+	3.3	77-79.99	D+	1.3	55-59.99
B	3.0	73-76.99	D	1.0	50-54.99
B-	2.7	70-72.99	F	0.0	00-49.99

STUDENT RESPONSIBILITIES:

Refer to the College Policy on Student Rights and Responsibilities at www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the College Student Misconduct: Academic and Non-Academic Policy at www.gprc.ab.ca/d/STUDENTMISCONDUCT

*Note: all Academic and Administrative policies are available at www.gprc.ab.ca/about/administration/policies/

UNIVERSITY TRANSFER (If applicable): UA, UL, AU, Augustana UA, CUC, GMU, KUC

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability. Please refer to the Alberta Transfer guide for current transfer agreements: www.transferalberta.ca