ENCMP100A - Computer Programming for Engineers
3 Credits, 3 hours lecture, 1.5 hours lab, 3.8 Engineering Units for U. Alberta

This course is an introduction to MATLAB with applications to engineering problems. Topics to be covered include an introduction to algorithmic problem solving, design methodologies, MATLAB language structure and syntax. Weekly laboratories offer students the opportunity to translate concepts presented in lectures into interesting application programs.

Prerequisites and/or co-requisites: None

Instructor

Jean-Pierre De Villiers (Lectures)
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Office Hours

Monday	13:00 – 13:50
Tuesday	13:00 – 13:50
Wednesday	13:00 – 13:50
Thursday	13:00 – 13:50
Friday	13:00 – 13:50

Hours of Instruction

Tuesday	09:00-10:20
Wednesday	09:00-10:20
Thursday	09:00-10:20

Required Resources

Optional: MATLAB – A Practical Introduction to Programming and Problem Solving, S. Attaway, Elsevier, 2017

Course Outcomes

Upon successful completion of this course, the student shall be able to:
- Use MATLAB as a tool to solve engineering problems.
- Develop modular MATLAB programs using user-defined functions.
- Visualize large sets of data using MATLAB plotting capabilities.

Evaluation

Assignments	5%
Labs	25%
Midterm Exam	25%
Final Exam	45%
Total	100%

A grade of C- is required for progression or transfer.

Assignments

Coding problems will be assigned on a regular basis. Assignments will be either submitted to MATLAB Grader for immediate feedback, or to an iLearn dropbox for more detailed review by the instructor. All program and script files are to be completed by the specified date and time. Assessment of this component will be based on the correctness, quality and clarity of the submitted solution (MATLAB script and program files). Non-functioning programs or scripts will receive a score of zero.

NO LATE SUBMISSIONS WILL BE ALLOWED UNDER ANY CIRCUMSTANCE.

Labs

Laboratory attendance is compulsory and no unexcused absences will be tolerated. Ninety minutes per week will be used for laboratory exercises. The labs are designed to help you develop your programming and problem-solving skills by having you work out solutions to assigned problems under the guidance of your instructor. Assessment of this component will be based on the correctness, quality and clarity of the submitted solution (MATLAB script and program files). As with assignments, lab exercises may either be graded automatically by MATLAB Grader, or manually by your instructor. Lab exercises are due at the end of the lab period, unless otherwise indicated. You are expected to work on lab exercises by yourself, though you may discuss your work with your instructor or a classmate; collaborative solutions are not allowed unless explicitly stated by your instructor.

Exams

There will be one midterm exam and a final exam in this course. The midterm exam takes placeas indicated in the weekly plan below. The midterm will cover all topics covered up to the date of the exam. The two-hour final exam will take place during the exam period at the end of the term. The final exam is a closed book test where you are expected to demonstrate mastery of the subject. You will be expected to solve a set of problems, some similar to work you have previously done, some more challenging. The labs are designed to help you prepare for this examination, so make sure you take full advantage of these exercises. All examinations will involve a mix of written and practical work; the written component of exams must be completed and submitted before progressing to the practical, computer-based component of the examination.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
Excellent	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
Good	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
Satisfactory	C	2.0	64 – 66.9	
Progression	C-	1.7	60 – 63.9	
Poor	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
Minimum Pass	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

Week	Lecture Topic	Lab
1	MATLAB basics: variables, arithmetic expressions	Lab 1 - Intro to MATLAB: expressions
2	Scripting to solve problems	Lab 2 − Solving engineering problems
3	Extending MATLAB	Lab 3 − Working with anonymous functions
4	Introduction to algorithms	Lab 4 − Working with human computers
5	Basic MATLAB Programming	Lab 5 − Conditional and Repetition Statements
6	User interaction, strings	Lab 6 - Strings
7	Family Day; Reading week	
8	Functions	Lab 7 - Midterm
9	Vectorization	Lab 8 − Functions and Vectorization
10	Cells, Tables, Data Structures	Lab 9 - Data Structures
11	File I/O	Lab 10 - File I/O
12	Advanced Functions	Lab 11 - Advanced Functions: argument lists
13	Advanced Graphics	Lab 12 - Advanced Plotting
14	Synthesis	Lab 13 - Advanced Mathematics

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Please Note:

Date and time allotted to each topic is subject to change.

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

Laboratory Safety

In the science laboratories, safety is important and therefore students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

Before entering the lab, students are responsible reviewing the lab manual and relevant Safety Data Sheets for the purpose of evaluating risks associated to health. Some hazards used in the laboratory may have additional risks to those with pre-existing medical conditions.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

Accessibility Services (CC167) supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934.

Skill Centre (CC119) provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

Wellness Services (CC260) offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Test Anxiety. Individual appointments can be made by calling 780-791-8934.

Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.