ENCMP 100A - Computer Programming for Engineers

3 Credits (3.8 Engineering Units), 14 weeks,4.5 hours per week

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

Instructor

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Office Hours

Monday	13:00-14:50
Tuesday	15:00-15:50
Thursday	09:00-09:50
Friday	12:00-12:50

Hours of Instruction

Monday	10:00 – 10:50	Room 239
Tuesday	09:00 – 10:50	Room 239 (Lab)
Wednesday	10:00 – 10:50	Room 239
Thursday	10:00 – 10:50	Room 239

Required Resources

MATLAB: A Practical Introduction to Programming and Problem Solving, Stormy Attaway;
Butterworth-Heinemann, 2013, 3rd edition, ISBN 978-0-12-405876-7
Other supplies

Course Outcomes

- Using MATLAB as a tool to solve engineering problems.
- Developing modular MATLAB programs using user-defined functions.
- Visualization of large sets of data using MATLAB plotting capabilities.
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Evaluation

The following components of course work will form the basis for computing your term grade:

Lab Assignments   20% (Weekly)

Quizzes   10% (Every three weeks or so)

Midterm Exam   25% (Week of February 16, 2015)

Final Exam   45% (Date TBA, in April)

Total   100%

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

Instructions for each lab are posted on the iLearn course page. All lab assignments are due at the end of the lab period, without exception. Submission of lab exercises is to be done electronically, via iLearn. All lab work must be your own work; no collaborative work is permitted. Any attempt to present another student's work as your own, or to present material obtained from Internet resources will result in an automatic failing grade for the course.

Quizzes will be given more or less every three weeks. Each quiz will last about 15 to 25 minutes. If a quiz is missed without a valid reason, a grade 0 will be assigned, and may contribute to a failing grade in the course.

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

This course is very much a hands-on introduction to MATLAB. Students should be prepared for lectures and labs that mix formal instruction with practical exercises to be carried out individually (the labs) and collaboratively (in class exercises). Advanced preparation (e.g. reading the relevant chapters ahead of lectures) is strongly recommended.
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Week	Chapter	Lecture Topic	Lab
1	1	MATLAB basics: program structure, variables, data types	Lab 1 - Intro to MATLAB
2	2	Arrays: Vectors and Matrices	Lab 2 - Matrix and vector operations
3	3	MATLAB basics: scripts, I/O	Lab 3 - Scripts I - basics of algorithms
4	4	Selection Statements	Lab 4 - Scripts II - functions
5	5	Repetition Statements and Vectorization	Lab 5 - Selection Statements
6	6	MATLAB programs	Lab 6 - Iteration
7		Family Day; Midterm Review; Midterm	
8	7	String Manipulation	Lab 7 - Vectorization
9	8	Cell Arrays and Data Structures	Lab 8 - Strings
10	9	Advanced Input/Output	Lab 9 - Data Structures
11	10/11	Advanced Functions and Plotting	Lab 10 - Advanced I/O
12	12	Applications: Linear Algebra and Statics	Lab 11 - Advanced Functions
13	15	Applications: Calculus	Lab 12 - Advanced Plotting
14		MATLAB Programming - Course Synthesis	Lab 13 - Advanced Mathematics

Please Note:
Date and time allotted to each topic is subject to change. 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.

Performance Requirements

You are responsible for keeping a complete record of classroom work (lecture notes, interactive problems, classroom exercises) in a proper notebook and in a set of files and folders on the Keyano student drive or on a USB stick. **Lecture overheads, when used, are posted to iLearn at the end of each week and _do not_ constitute a complete record of lecture materials.**

Laboratory Safety

In the science laboratories, safety is important.

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.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a student's 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

Penalties for academic offences range from a verbal reprimand to dismissal from the College, and in certain circumstances may involve legal action.

Specialized Supports

Counselling and Disability Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Jean-Pierre De Villiers, Instructor

Louis Dingley, Chair   Date Authorized

Guy Harmer, Dean   Date Authorized

Signed copies to be delivered to:
Instructor
Registrar's Office