CS 240: Introduction to Engineering Programming

Lecturer

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<tr>
<td>Robert Sorenson</td>
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<tr>
<td>Office: EMS 386F</td>
<td></td>
</tr>
<tr>
<td>Phone: 229-2796</td>
<td></td>
</tr>
<tr>
<td>E-mail: <a href="mailto:rds@uwm.edu">rds@uwm.edu</a></td>
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</tr>
<tr>
<td>Office hrs:</td>
<td>T.B.A.</td>
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<td>or by appointment</td>
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Course Objectives

CS 240 seeks to teach its students basic engineering programming skills using the MATLAB programming language. Specifically a successful student will have the ability to:

- Perform basic input and output.
- Create and use scalar as well as matrix variables.
- Create and use functions.
- Plot in both 2D / 3D Cartesian coordinate systems.
- Use Boolean logic with control structures (selection and loops), to determine execution path of a program.
- Create and compute with Matrices.
- Program symbolic mathematics.

Key Policies and Student Responsibilities

Workload: This course entails a fair amount of work doing homework assignments and quiz / exam preparation. The following is a breakdown of the expected course workload (in hours):

<table>
<thead>
<tr>
<th>Activity</th>
<th>hours spent</th>
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<tbody>
<tr>
<td>Lecture meetings</td>
<td>30</td>
</tr>
<tr>
<td>Preparation for lectures</td>
<td>15</td>
</tr>
<tr>
<td>Lab meetings</td>
<td>30</td>
</tr>
<tr>
<td>Writing weekly programs</td>
<td>45</td>
</tr>
<tr>
<td>Studying for weekly quizzes</td>
<td>12</td>
</tr>
<tr>
<td>Studying for midterm exams</td>
<td>4</td>
</tr>
<tr>
<td>Studying for the final exam</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>140</td>
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</table>

Late Policy: Homework assignments are only accepted late when an extension has been granted to the entire class. You are strongly advised to start early on the homework assignments. Unfortunately, computer systems sometimes go down before an assignment is due. You need to plan for these, and other, unexpected events. Homework assignments are not accepted after the due dates.

Make-up Policy: Failure to attend an exam without substantial and verifiable cause will not in any way warrant a make-up. The exam dates are posted below, please plan accordingly. Also students must contact their instructor as soon as possible to be eligible for a make-up.

Accommodations and Religious Obligations: Please see the official UWM policy statement for complete descriptions.
Prerequisite

- Math Placement Code of 40 or Math 116(P)

To be ready to take CS 240, a student must be comfortable with college algebra (as taught in UWM’s Math 116)

If you have any questions about this prerequisite, please feel free to talk to your instructor.

Course Materials

Required Text:

- Delores Etter
  - *Introduction to MATLAB*
  - Third edition
  - Pearson 2015

Grading

- Programming Assignments (8 or more) = 15% of course grade. The lowest single assignment score will be dropped.
- Lab Exercises (8 or more) = 10% of course grade. The lowest single lab score will be dropped.
- Lab Quizzes (8 or more) = 15% of course grade. The lowest single quiz score will be dropped.
- In Class Examinations (3):
  - Midterm I = 18% of course grade.
  - Midterm II = 18% of course grade.
  - Final = 24% of course grade.

Course letter grades will be assigned using the following scale, unless we decide that this scale is too severe, in which case we will adjust the scale downward.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
<th>D-</th>
<th>F</th>
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</thead>
<tbody>
<tr>
<td>Minimum Score</td>
<td>92</td>
<td>88</td>
<td>84</td>
<td>80</td>
<td>77</td>
<td>74</td>
<td>70</td>
<td>67</td>
<td>64</td>
<td>60</td>
<td>57</td>
<td>0</td>
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Programming Assignments

Most weeks you will be given a problem description / specification which you are to write a computer program which solves the problem / satisfies a set of specification. Large portions of the quizzes and exams will test your understanding of course material that is illustrated in these assignments. Each program will be graded on a 10-point scale.

You are allowed to work together (collaborate) on the programming assignments, however you alone are responsible to make sure that you understand not just the specifics of a particular assignment solution, but the general use of the programming constructs used in that solution - which shall be tested on quizzes and examinations. In other words, you should strive to be able to write your programs with minimal to no collaboration with others.

Program descriptions with their due dates are posted on the course home page weekly. You will “hand in” your program solutions by means of D2L’s Drop Boxes.

Lab Exercises

Most weeks you will be given a lab exercise to be completed during your lab time. The lab exercises will be counted as completed or not completed.
Lab Quizzes
Most weeks you will be given a quiz in your lab section, except when you have a midterm in the same week. The quizzes cover material from recent lectures and homework assignments. Each quiz will be graded on a 10-point scale.

Examinations
You will take two midterms and a final examination, which will be based on the material covered by lectures, assignments, labs, quizzes, and our textbook readings.

The midterm examinations will be held at your normal lecture time in your normal lecture room, the examinations are closed notes and book.

The final examination will be held at a time and location to be announced in lecture and on the course home page when it is known, this examination is also closed notes and book.

Academic Misconduct
You can find extensive information on UWM's Academic Misconduct Policy at this URL:

http://www.uwm.edu/CHS/administrationinfo/acadmisc.html

Intended Course Outline
1. Introduction (1.5 weeks)
   - Engineering environment
   - Engineering computing
   - Engineering problem solving
2. Fundamentals (1.5 weeks)
   - Basic operations
   - Output options
   - Saving work
3. Functions (1.5 weeks)
   - Elementary Mathematical
   - Trigonometric
   - Data analysis
   - Random number generation
   - User defined
4. Plotting (2 weeks)
   - In 2D Cartesian coordinate system
   - In 3D Cartesian coordinate system
   - Editing / Creating plots
5. Control Structures (3 weeks)
   - Relational & Logic operators
   - Selection structures
   - Loops
6. Matrix Computations (2 weeks)
   - Special matrices
• Matrix operations & functions
• Systems of linear equations

7. Symbolic Mathematics (2 weeks)
• Symbolic algebra
• Equation solving
• Differentiation & Integration