



Algorithms and Programming

Spring 2019



Algorithms and Programming

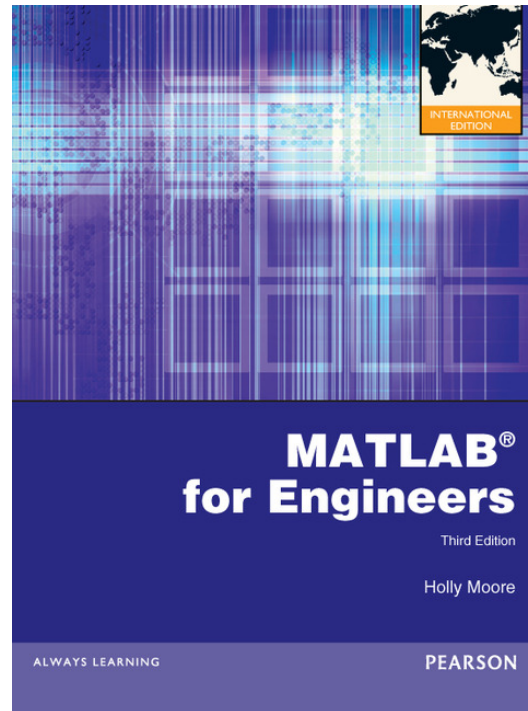
Instructor	(Asst.Prof.) Dr.Mustafa BAYSAL
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Office hours	11:00-12:00 Monday 15:00-16:00 Wednesday



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Required Textbook:

Holly Moore, *MATLAB for Engineers*, PEARSON, 2011; ISBN 978-0-13-210325-1



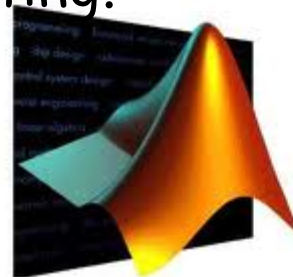


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Course Description:

Intended for engineering students who want a comprehensive introduction to fundamental programming concepts using a block-structured language (MATLAB).

General problem-solving techniques, including the concept of step-wise refinement applied to the development of algorithms. Programming style, structure, documentation, and testing.



MATLAB
The Language of Technical Computing
The MATH WORKS
Inc.



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Course Objectives:

Upon completion of course, students should have learned how to construct computer program flow diagrams, implement programs using MATLAB and apply those skills towards the numerical solution of engineering problems. Specifically:

- ❖ Understand basic foundations of computer programming
- ❖ Be able to do simple and complex calculation using Matlab
- ❖ Have a basic understanding of how engineers use computers to numerically solve programs
- ❖ Understand basic algorithms for (1) numerical integration, (2) numerical differentiation, (2) curve fitting, (3) solution of simultaneous linear equations and (4) numerical solution of ordinary differential equations
- ❖ Have a reasonably good knowledge of the MATLAB programming environment



Expected Course Outcomes:

After the completion of this course, students are expected to:

- Be reasonably proficient at writing computer programs using MATLAB
- Be able to formulate computer algorithms and implement those algorithms in MATLAB to solve engineering problems.
- Be able to document code
- Be able to decipher MATLAB code written by others
- Be able to graphically present the output of computer programs in a well thought out manner





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Grading Policy:

2 In-term Exams : 45 pts.

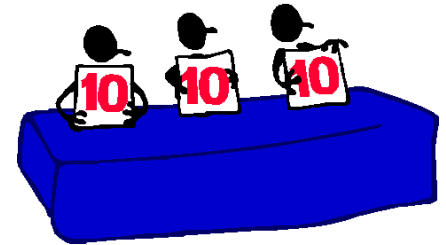
Homework : 10 pts.

Quiz: 5 pts.

Final exam: 40 pts.

Less than 40 pts.  DD or FF

There will be no exception to this policy.



Homework Policy:

✓ You will receive a zero for homework turned in after the due date.



✓ When a homework assignment involves programming, you will need to supply me with electronic copy of any .m files. (e-mail address for homeworks will given later)

✓ Copying on exams will result in a score of **0 (zero)** for everyone involved, including the person supplying the information.

✓ There will be no make-up for missed in-class quizzes.



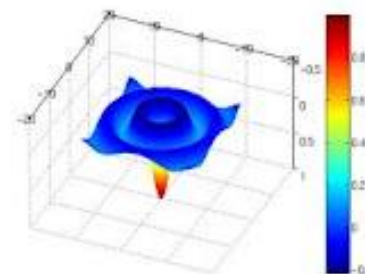
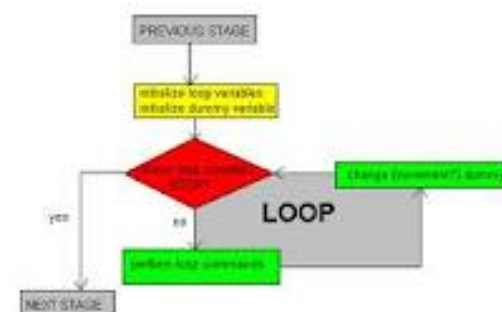
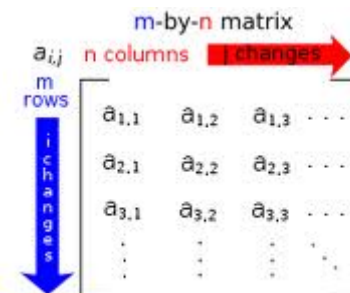
Attendance Policy:

- Class attendance is MANDATORY.
- Students who have more than 5 absences (~30%) are subject to being dropped from the course.
- Perfect attendance is expected to succeed in the course.



Topics Covered:

- Introduction to MATLAB,
- Matrices and vectors,
- Plotting using MATLAB,
- MATLAB script and function files,
- Loops,
- Solving linear equation systems,
- Solving ODEs
- Finding roots,
- Interpolation and curve fitting,
- Numerical differentiation
- Numerical integration.





CONTENTS:

- 1 • ABOUT MATLAB®
- 2 • MATLAB® ENVIRONMENT
- 3 • BUILT-IN MATLAB® FUNCTIONS
- 4 • MANIPULATING MATLAB® MATRICES
- 5 • PLOTTING
- 6 • USER-DEFINED FUNCTIONS
- 7 • USER-CONTROLLED INPUT AND OUTPUT
- 8 • LOGICAL FUNCTIONS AND SELECTION STRUCTURES
- 9 • REPETITION STRUCTURES
- 10 • MATRIX ALGEBRA
- 11 • OTHER KINDS OF ARRAYS
- 12 • SYMBOLIC MATHEMATICS
- 13 • NUMERICAL TECHNIQUES
- 14 • ADVANCED GRAPHICS***
- 15 • CREATING GRAPHICAL USER INTERFACES
- 16 • SIMULINK®—A BRIEF INTRODUCTION

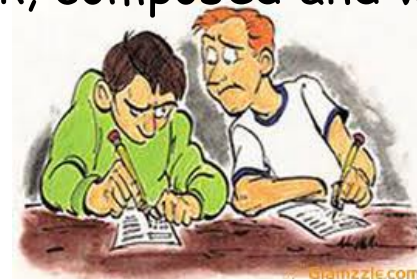


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Academic honesty:

It is your responsibility as a student to adhere to the university and department regulations and policies, as found in various publications, e.g., Academic Policies. All cases of suspected and confirmed cheating/plagiarism will be dealt with as set forth in the university policies of academic dishonesty.

I expect each student to act honestly and to do his or her own work. It is my responsibility and my intention to protect the interests of the honest students. Therefore **CHEATING IN ANY FORM WILL NOT BE TOLERATED**. Now, I don't mind if you help each other with understanding the material; in fact, I encourage it. The key point is this: Anything that you turn in—homework, examinations, whatever—with your name on it must be your own work, composed and written by you without looking at others' work.





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Updates:

This syllabus is subject to modification. Any changes will be announced in class and posted on the instructor's website.

<http://avesis.yildiz.edu.tr/baysal>

The instructor reserves the right to make changes to this syllabus as necessary.

