MATH 2131

Linear Algebra Labs with MATLAB

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Hi Dear students, I am Rasoul, welcome!! according to my experience this course is categorized as an easy course and I am not going to make it hard. Being active in the class will bring you an "A". You can be absent or inactive and yet get an "A" but the chance is a little bit lower. You can find the grade distribution and etc here. No need to buy a book, no knowledge in programming but you should know the basics of linear algebra.

This syllabus is a schedule of topics we will cover. Due to the dynamic nature of the course, this syllabus may be subject to change. Any changes will be throughly introduced to the students in the course.

Course Description: This course is intended for Math majors. These labs reinforce key concepts of linear algebra using a variety of class-tested MATLAB exercises. No prior knowledge of, or experience with, MATLAB is required. MATLAB commands will be introduced gradually.

Prerequisite(s): Credit for, or concurrent enrollment in MATH 2331.

Credit Hours: 1

Suggested Text(s): *Linear Algebra*, 4$^{\text{th}}$ Edition, David C. Lay. All required materials will be provided. (No need to buy the book)

Software: MATLAB Student Version (preferably R2015B version or higher)

Course Objectives:
At the completion of this course, students will be able to:

1. Understand basic MATLAB structure and functions.
2. Enter and manipulate different types of matrices and functions of matrices in MATLAB.
3. Understand how to read in and manipulate data from external sources such as text files in MATLAB.
4. Be able to apply fundamental principles of Linear Algebra to application in MATLAB programming.

Grade Distribution:

Assignments	45%
Project 1	10%
Project 2	10%
Project 3	10%
Final	20%
Attendance	3%
Class Activity	3%

Letter Grade Distribution:

>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	<= 59.99	F

The Final Grade will be posted by the instructor and it can be different from this table.

Course Policies:

- **General**

  - Attendance will not be taken regularly but occasionally.

  - Students can not use their phones and laptops for more than 10 mins unless they do the programming. No video game or chatting in the class is allowed. Students can talk VERY quietly but loud talking or generating any kind of distractions in the class will not be tolerated (HEAVY grade penalty).

  – Students are expected to download the MATLAB Student Version R2015B or higher from UIT courseware and create an account with MATLAB prior to the beginning of the second week of courses. This software is freely available to all students enrolled at the University of Houston. Students are expected to contact UIT to resolve any issues they may experience.

- **Grades**

  – Grades in the **C** range represent performance that **meets expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**.

  – Grades will be maintained on Blackboard. Students are responsible for tracking their progress by referring to the online gradebook.

- **Projects and Assignments**

  – Students are encouraged to work with peers. However, students are expected to turn in their own projects and assignments. A student may **not** turn in another's work or code as their own work! Do not simply copy! **Offering** and **accepting** exact solutions from others is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the Academic Honesty Policy**.

- **No late assignments will be accepted under any circumstances**.

- **Attendance and Absences**
  - Attendance will not be taken regularly. However, it is imperative for your understanding and clarity on assignments and projects that you attend class.
  - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

- **CAPS: Counseling and Psychological Services** CAPS offers a variety of services including crisis intervention, counseling, outreach, and consultation. All currently enrolled students at the University of Houston are eligible for clinical services at CAPS. CAPS offers various free and low-cost services to eligible UH current students. For more information visit www.uh.edu/caps.

  Contact Number: (713) 743-5454
  Location: CAPS is located on the second floor of Student Service Center 1 (Bldg 524 on the UH Campus Map), in room 226.

Academic Honesty Policy Summary:

Introduction

In addition to skills and knowledge, the University of Houston aims to teach students appropriate Ethical and Professional Standards of Conduct. The Academic Honesty Policy exists to inform students and Faculty of their obligations in upholding the highest standards of professional and ethical integrity. All student work is subject to the Academic Honesty Policy. Professional and Academic practice provides guidance about how to properly cite, reference, and attribute the intellectual property of others. Any attempt to deceive a faculty member or to help another student to do so will be considered a violation of this standard.

Instructor's Intended Purpose

The student's work must match the instructor's intended purpose for an assignment. While the instructor will establish the intent of an assignment, each student must clarify outstanding questions of that intent for a given assignment.

Unauthorized/Excessive Assistance

The student may not give or get any unauthorized or excessive assistance in the preparation of any work.

Authorship

The student must clearly establish authorship of a work. Referenced work must be clearly documented, cited, and attributed, regardless of media or distribution. Even in the case of work licensed as public domain or Copyleft, (See: http://creativecommons.org/) the student must provide attribution of that work in order to uphold the standards of intent and authorship.

Declaration

Online submission of, or placing one's name on an exam, assignment, or any course document is a statement of academic honor that the student has not received or given inappropriate assistance in completing it and that the student has complied with the Academic Honesty Policy in that work.

Consequences

An instructor may impose a sanction on the student that varies depending upon the instructor's evaluation of the nature and gravity of the offense. Possible sanctions include but are not limited to, the following: (1) Require the student to redo the assignment; (2) Require the student to

complete another assignment; (3) Assign a grade of zero to the assignment; (4) Assign a final grade of "F" for the course. A student may appeal these decisions according to the Academic Grievance Procedure. (See the relevant section in the Student Handbook.) Multiple violations of this policy will result in a referral to the Conduct Review Board for possible additional sanctions.

The full text of the Academic Honesty Policy is in the *Student Handbook*.

Tentative Course Outline:
The weekly coverage might change as it depends on the progress of the class.

Week	Content
Week 1	Install all necessary software for the course.
Week 2	MATLAB Coding Basics
Week 3	Systems of Linear Equations
Week 4 and 5	Vector and Matrix Equations
Week 6 and 7	Linear Transformations and Matrix Multiplication
Week 8	Inverse of a Matrix
Week 9	Determinants
Week 10 and 11	Eigenvalues and Eigenvectors
Week 12 and 13	Limit Predictions (Matrix Models of Dynamical Systems)
Week 14	Linear Regression
Final Exam	Will be announced further in the semester.