

MA 2071: Matrices and Linear Algebra I (B-Term 2024-Group 2)

All plans are **tentative** and subject to change.

Instructor: Dr. Qingshuo Song (Department of Mathematical Sciences)

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Phone: 508 831 6273

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Lectures: MTRF 11 am at UH 500 (It's not a typo)

Office Hours: T 12 - 1 pm at SH314 or by appointment

Discussions and TAs:

For any questions or to discuss the course content, feel free to attend any of the available office hours. You are not restricted to the office hours of your own discussion leader.

BD05, Lil Peeler, lbpeeler@wpi.edu

- Discussion: W 2 pm, Stratton Hall 301,
- Office hours: F 10 am, at SH 410
- MTC hours: Th 1 pm

BD07, Duyen Le, ddle@wpi.edu

- Discussion: W 4 pm, Stratton Hall 301
- Office hours: W 3 pm, at SH 410
- MTC hours: T 3pm

BD06, Marcos Delgado, mdelgado1@wpi.edu

- Discussion: W 1 pm, Stratton Hall 301
- Office hours: T 1-2 pm, F 1-2pm at SH207

BD08, Marcos Delgado, mdelgado1@wpi.edu

- Discussion: W 12 pm, Salisbury Labs 105
- Office hours: T 1-2 pm, F 1-2pm at SH207

Course Coordinator, Teddy Hellgren, tnhellgren@wpi.edu

- MTC hour: M 4 pm

Course Description

The course MA 2071 covers topics in matrix algebra and vector spaces, including systems of linear equations, eigenvalues and eigenvectors, least squares, vector spaces, inner products, introduction to numerical techniques, and applications of linear algebra. The material covered in this course is primarily from chapters 1-6 of the textbook. No specific background knowledge is required for this course.

Textbook (optional)

Linear Algebra and Its Applications – 5th edition (2016) by D. C. Lay, S. R. Lay, and J. J. McDonald, ISBN-10: 0-321-98238-X. ISBN-13: 978-0-321-98238-4.

Lecture Engagement

There will be in-person lectures four times a week and attendance is strongly encouraged.

Discussions

The TAs and PLAs will organize weekly discussion sessions for students to discuss their progress and any relevant issues related to the course. Attendance at these sessions is strongly encouraged.

Assessment

Homework: 20%

Quizzes (5-6 quizzes): 20%

Projects (1-2 projects): 10%

Midterm: 25%, **on 11/19 T**

Final: 25%, **on 12/12 Th**

Letter grades will be assigned based on the following scale:

A: 90.00 – 100.00% B: 80.00 – 89.99% C: 70.00 – 79.99% NR: 0.00 – 69.99%

The instructor has the discretion to make adjustments to the course as necessary. Evidence of active engagement in class, discussion, and office hours may be taken into consideration when making adjustments. However, it should be noted that NR (No Record) grades will not be given upon request.

Quizzes and exams

Quizzes may be given at random during discussion hours throughout the term to encourage attendance. In addition, there will be a scheduled midterm and final exam during the in-class time. No make-up exams will be allowed, except in cases of documented evidence. **All requests for make-up exams must be made within 2 days after the quiz or exam date.**

Projects

1-2 group projects will be assigned. Each group can consist of 1-3 members, and students are encouraged to form new groups for each project. All projects must be submitted individually, but group members, if any, must be indicated.

Homework (WeBWork via Canvas)

Homework for this course will consist of online problem sets using WeBWork via Canvas, an internet-based homework service that is free to students. The link to the WeBWork page for our class will be available on Canvas/Assignment.

To get your WeBWork score successfully transferred to the Canvas grade system, one **MUST** access the WeBWork page **by clicking the link provided by Canvas**. Sometimes, the grade transfer from WeBwork may be delayed for various reasons, and it will be collectively updated before giving the final grade.

Homework problems will be announced through Canvas every week (mostly during the weekend) and the due dates will be usually one week after (mostly Wednesday midnight). You are expected to check WeBWork regularly for the due dates, which may change depending on class progress and the amount of material covered. **There will be no deadline extensions for any WeBWork assignment under any circumstances. Instead, the lowest two scores will be dropped when calculating the final grade whenever your grade is at the margin.**

Grading Corrections Policy:

If you believe that there has been a grading error on your exam, you must notify the course grader within two days of receiving your exam back. Grade changes will not be made outside of this time frame.

Canvas

Material for this course will be made available on Canvas (<https://canvas.wpi.edu/>). Course information (including a copy of the syllabus), supplementary material and worksheets, recommended problems from the text, and useful links will be posted on this site. Grades will also be posted on Canvas.

WPI Email Account

Make sure to check your WPI email account daily for any course announcements that the instructor may send.

Additional Help from MTC

Tutoring is available for free on a first-come, first-served basis at the Mathematics Tutoring Center (MTC) via zoom. No appointment is necessary, so you may drop in at any time. The schedule of tutors will be posted on canvas or alternatively online on the Department of Mathematical Sciences resources page

- <https://www.wpi.edu/academics/departments/mathematical-sciences/resources>

Additional Help from MASH

Peer tutoring and Math and Science Help (MASH) will be offered in person by the Academic Resources Center (ARC). No appointments are needed for MASH group sessions. If a student has a time conflict or there is limited tutoring availability, they can complete and submit an [ARC Inquiry Form](#) to request an appointment that aligns with their schedule. Further information about MASH and tutoring offered by the ARC is located on the [Academic Resources Center Canvas Page](#) and on the [Academic Advising and Academic Resources Center WPI Webpage](#).

Calculators

Using calculators will not be permitted on any exam or quiz unless otherwise instructed.

Academic Integrity

All students are expected to be familiar with and adhere to WPI's policy on academic integrity (i.e., no cheating, fabrication, facilitation, or plagiarism). Please refer to the WPI Academic Honesty Policy within the Student Code of Conduct. Academic integrity violations will be prosecuted according to the university's policy.

Disability Services

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Office of Accessibility Services (OAS). The OAS can be contacted by phone at 508-831-4908 and by e-mail at accessibilityservices@wpi.edu. Students granted extended testing time should arrange to take their exams at the OAS.

Tentative Course Schedule

****Subject to Change****

Sections Topics

- 1.1 – 1.7 Linear systems and matrices
- 1.8 – 1.9 Linear transformations – time-permitting
- 2.1 – 2.3 Matrix operations
- 2.8 – 2.9 Subspaces, dimensions, and rank
- 3.1 – 3.2 Determinants
- 4.1 Vector spaces and subspaces
- 5.1 Eigenvalues and eigenvectors
- 5.2 – 5.3 Characteristic equation, diagonalization – time-permitting
- 6.1 – 6.5 Orthogonality, least squares
- 6.6 – 6.8 Inner product spaces, applications – time-permitting