

MA 2210: Mathematical Methods in Decision Making

D term 2025

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

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

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Office: Stratton Hall 314

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Lectures: MTRF 10 am at SH 301

Office Hours: M 12 - 1 pm at office or other times by appointment

Discussions and TAs:

If you have any questions or would like to discuss the course content, you are welcome

- Jiang, Yulong <yjiang3@wpi.edu>
- Discussion: W | 10:00 AM - 10:50 AM at SH 301
- Office hours: W 12-1 pm at SL 412

Course Description

This course introduces students to the principles of decision theory as applied to the planning, design and management of complex projects. It will be useful to students in all areas of engineering, actuarial mathematics as well as those in such interdisciplinary areas as environmental studies. It emphasizes quantitative, analytic approaches to decision making using the tools of applied mathematics, operations research, probability and computations. Topics covered include: the systems approach, mathematical modeling, optimization and decision analyses. Case studies from various areas of engineering or actuarial mathematics are used to illustrate applications of the materials covered in this course. Recommended background: MA 1024. Suggested background: Familiarity with vectors and matrices. Although the course makes use of computers, no programming experience is assumed. Students who have received credit for CE 2010 may not receive credit for MA 2210. Industrial Engineering majors cannot receive credit for both MA 2210 and BUS 2080.

Textbook (optional)

Introduction to Operations Research by Frederick Hillier and Gerald Lieberman.

Convex optimization by S. Boyd, https://web.stanford.edu/~boyd/cvxbook/bv_cvxbook.pdf

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 (4-6 quizzes): 20%

Midterm: 30%, **on 04/14 M**

Final: 30%, **on 05/06 T**

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 attendance, 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 during discussion hours throughout the term to encourage attendance unless there is a midterm/final arranged in the same week. 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.**

Homework

Homework problems will be announced through Canvas every week and the due dates will be usually one week later. You are expected to check Canvas 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 assignment under any circumstances. Instead, the lowest score 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). 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) tutors on the 5th floor of Unity Hall in the ARC or the Exam Proctoring Center (EPC, UH 505). Students should use tutortrac.wpi.edu to sign up for individual tutoring appointments that fit their schedules. 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.

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

(<https://www.wpi.edu/about/policies/academic-integrity>).

Academic integrity violations will be prosecuted according to the university's policy. For more details as to what constitutes academic dishonesty, please see

<https://www.wpi.edu/about/policies/academic-integrity/dishonesty>.

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 email at accessibilityservices@wpi.edu. Students granted extended testing time should arrange to take their exams at the OAS.

WPI Policies

Students are responsible for reviewing WPI's policies at <https://www.wpi.edu/about/policies>, pertaining to their rights and responsibilities.