

### Contact Information

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Office	129 Eggers Hall
Office hours	Monday and Wednesday 2:30 P.M.–3:30 P.M.
Teaching Assistant	Zhuoran Shang
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Office	043 Eggers Hall
Office hours	Tuesday and Thursday 10 A.M.–11 A.M.
Class location	207 Hall of Languages
Class time	Monday and Wednesday 3:45 P.M.–5:05 P.M.

### Text

- Michael **Hoy**, John **Livernois**, Chris **McKenna**, Ray **Rees**, and Thanasis **Stengos** (2011): *Mathematics for Economics*, Third Edition, Cambridge: The MIT Press, ISBN: 9780262015073.
- **Lecture slides** will also be posted on Blackboard: <https://blackboard.syracuse.edu>, which follow the material covered in the textbook.

### Prerequisites

The following courses are prerequisites for ECN 505:

- either ECN 301 or ECN 311; and
- MAT 295; and
- MAT 296.

Prior exposure to and familiarity with the following concepts from calculus are assumed: sequences, limits, continuity, differentiation.

### Course Learning Objectives

ECN 505 has two foundational course learning objectives, which are aligned to the following competencies:

**Scientific Inquiry & Research Skills:** One of the foundational course learning objectives in ECN 505 is to provide an overview of the use of various mathematical techniques in the course of economic analysis, with an emphasis on the ultimate development of

the theory of constrained optimization—a cornerstone of modern mathematical economics.

**Critical & Creative Thinking:** The other foundational course learning objective in ECN 505 is to endow students with the ability to apply constrained-optimization techniques to a variety of problems in both microeconomics and macroeconomics.

## Evaluation

The final grade will consist of three components:

- 30% problem sets** assigned every two weeks;
- 35% midterm exam** Wednesday, March 23, in class;
- 35% final exam** Thursday, May 12, 10:15 A.M.–12:15 P.M.

Percentages are converted to letter grades based on the following table:

92–100	A	72–75	C+
88–91	A-	68–71	C
84–87	B+	64–67	C-
80–83	B	60–63	D
76–79	B-	0–59	F

In case the overall class score is lower than expected, this grading scale will be adjusted via grading on a curve. Under no circumstances will the above grading policy change to your disadvantage.

## Policies

- Problem sets will be announced and posted approximately every two weeks. You will have one week to submit your solution to each problem set.
- Problem sets will be due *at the beginning of class*. Please provide a paper copy of your write-up and staple multiple pages together. Late submission or electronic copies will not be accepted unless otherwise specified.
- You are allowed to work together on problem sets in groups, but each of you is expected to submit a *complete and independent* write-up. Please refrain from mindlessly copying solutions from each other.
- Requests for makeup exams will be granted *only* under the following circumstances: (i) religious holiday observances (see below); or (ii) medical emergencies, provided that absence is advised by a health-care provider at the Health Center. You will need to submit written documentation issued by a health-care provider; simply visiting

the Health Center is not a viable excuse for missing an exam. Makeup exams will *not* be provided under any other circumstances—please keep this in mind when making such plans as job interviews or personal trips.

- The two exams are non-cumulative. This means that the final exam will cover only the second half of the course material. However, please do not be tempted to interpret this as a free pass to “forget” the first half after the midterm, as the concepts we cover in the second half of the course crucially build on those covered in the first half.
- Both exams will be closed-book. Use of calculators, phones, or other electronic equipment is not allowed during exams. Communication with classmates or persons other than the instructor or proctor during exams is prohibited.
- Class attendance is expected. As per the University’s policy, all students who never attend or stop attending classes must be reported to the Office of the Registrar. Each student is responsible for compliance with all course material, announcements, and exams made in class. If you must miss a class, please check Blackboard and communicate with your classmates to remain up to date.
- While I am committed to assisting you with administrative inquiries through email within a reasonable time frame, I will be generally unable to answer emails containing questions about the course material itself. The same applies to the teaching assistant. With such questions, please visit either of us during our respective office hours.

### Religious Holiday Observances

Syracuse University does not set aside days for any religious holiday. **Students must notify instructors of any religious observances by Monday, February 14.** For any observances occurring before this deadline, students must notify faculty at least two academic days in advance.

Syracuse University’s Religious Observances Policy, found at <https://policies.syr.edu/policies/university-governance-ethics-integrity-and-legal-compliance/religious-observances-policy/>, recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their traditions. Under the policy, students are given an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance, provided they notify their instructors no later than the academic drop deadline. For observances occurring before the drop deadline, notification is required at least two academic days in advance. Students may enter their observances in MySlice under Student Services/Enrollment/My Religious Observances/Add a Notification.

### **Academic Integrity**

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy holds students accountable for the integrity of all work they submit and for upholding course-specific, as well as university-wide, academic-integrity expectations. The policy governs citation and use of sources, the integrity of work submitted in exams and assignments, and truthfulness in all academic matters, including course attendance and participation. The policy also prohibits students from submitting the same work in more than one class without receiving advance written authorization from both instructors and from using websites that charge fees or require the uploading of course material to obtain exam solutions or assignments completed by others and presenting the work as their own. Under the policy, instructors who seek to penalize a student for a suspected violation must first report the violation to the Center for Learning and Student Success (CLASS). Students may not drop or withdraw from courses in which they face a suspected violation. Instructors must wait to assign a final course grade until a suspected violation is reviewed and either upheld or overturned. Upholding academic integrity includes abiding by instructors' individual course expectations, which may include the protection of their intellectual property. Students should not upload, distribute, or otherwise share instructors' course materials without permission. Students found in violation of the policy are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered, as described in the Violation and Sanction Classification Rubric. Students are required to read an online summary of the University's academic-integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information about the policy, see <https://class.syr.edu/academic-integrity/policy/>.

The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

### **Accommodations for Students with Disabilities**

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. If there are aspects of the instruction or design of this course that result in barriers to your inclusion and full participation, I invite you to contact me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability accommodations or register with CDR, please visit their website at <https://disabilityresources.syr.edu>, call (315) 443-4498, or email [disabilityresources@syr.edu](mailto:disabilityresources@syr.edu) for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with you to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible to begin this process.

### Course Outline

The following table provides an overview of the topics we are going to cover in this course along with the corresponding chapters in the textbook.

Topic	Textbook reading
Review of fundamentals (optional)	Chapter 2
Sequences, series, and limits	Chapter 3
Continuity	Chapter 4
Differentiation and derivatives	Chapter 5
Univariate optimization	Chapter 6
Systems of linear equations	Chapter 7
Matrices	Chapter 8
Determinants and inverses	Chapter 9
Eigenvalues and quadratic forms	Chapter 10
Multivariate calculus	Chapter 11
Multivariate optimization	Chapter 12
Constrained optimization	Chapter 13
Comparative statics	Chapter 14
Concave programming and Kuhn – Tucker conditions	Chapter 15