

## Online Econ 8370 – Mathematics for Economics

Fall 2022

Department of Economics  
University of Missouri-Columbia

**INSTRUCTOR:** DR. XINGHE WANG  
**PHONE:** 573-882-4954  
**EMAIL:** [wangx@missouri.edu](mailto:wangx@missouri.edu)  
**WEBPAGE:** <https://economics.missouri.edu/people/wang>

(Note: All times used in this syllabus are US Central Time (CT). Daylight saving time in 2022 will end at 2:00am on Sunday, November 6.)

### COURSE DESCRIPTION

The aim of this course is to cover essential mathematics used in economics. Topics include introductory linear algebra, single- and multi-variable functions, multivariate calculus, comparative statics analysis, matrix algebra, equilibrium analyses, unconstrained optimization, equality constrained optimization, and their applications in economics. May be repeated for credit. Graded on A-F basis only. Prerequisites: ECONOM 4351 or equivalent; MATH 1320 or equivalent.

### LEARNING OBJECTIVES

After completing the entire course, you are expected to be able to

- Understand fundamental concepts of single- and multi-variable functions
- Understand basic concepts of matrix algebra
- Understand basic concepts of unconstrained and constrained optimization
- Apply basic mathematical concepts to analyze some important economic problems

### REQUIRED TEXTBOOK

Mathematics for Economics, Third Edition, MIT Press  
by Michael Hoy, John Livernois, Chris McKenna, Ray Rees and Thanasis Stengos

### ONLINE COURSE ACCESS

You may access the course via <https://umsystem.instructure.com>. If you run into any technical difficulties, please contact the Mizzou IT Help Desk via phone 573-882-5000 or e-mail [helpdesk@missouri.edu](mailto:helpdesk@missouri.edu) or from the self-service portal:

<https://cherwell.umsystem.edu/CherwellPortal/DoITPortal>.

### OFFICE HOURS

You are welcome to email me requests for Zoom meetings. My preferred Zoom meeting times are on Thursdays from 10am-11:30am CT. However, if you cannot meet me during these hours, specify in your email your available times and I will respond with a proposed meeting time based on your availability and mine.

## Discussion Board

For general questions (i.e., not specific to you personally), you are encouraged to post to the weekly discussion board on our course Canvas site. Each week's board can cover topics covered during the week as well as topics from previous weeks. All of you are strongly encouraged to both post and answer questions on the discussion board. It will be monitored throughout the week.

## ASSIGNMENTS AND TESTS

- Problems from Work Problems (WP) will be selected as homework problems. Assignments will be made for weeks 2, 4, 7, 9, 12 and 14. Your answers are due by 11:59pm on Saturday of the week. No late submissions will be accepted.
- There is a test for each of three segments of the course. Each segment test will be on Thursday night in the segment review week. Each test will start at 7pm CT and end at 9pm CT (15 minutes for setting up; 90 minutes for answering questions; and 15 minutes for submission.)
- All assignments and tests must be submitted in Canvas by the deadline in one file (Please read the Instruction on File Submission file in the Course Info module). Please note that once the due time has reached, the link to submit disappears and you can no longer submit your answers.

## MISSED TEST POLICY

You are expected to take all tests. But if you have an extraordinary circumstance that affects your ability to take a test, please contact the instructor as early as possible for an alternative arrangement.

## SHOW YOUR INDEPENDENT WORK

All tests in this class will be open book and unsupervised. However, it is very important that all of your submitted answers are your own independent work. You are not allowed to consult anyone else.

## GRADING

The course will be graded on the basis of six homework assignments and three tests. All assignments together will be worth 10 percent of your final grade. Each test will be worth 30 percent of your final grade. Letter grades will be assigned using the Grade Table below.

### Plus/Minus Grade Table (Usual rules will be used to round decimals)

A+: 97-100 percent	A: 93-96 percent	A-: 88-92 percent
B+: 81-87 percent	B: 74-80 percent	B-: 67-73 percent
C+: 61-66 percent	C: 55-60 percent	C-: 50-54 percent
F: below 50 percent		

## ADVICE (HOW TO BE SUCCESSFUL)

- Keep up on a regular schedule.
- Read the textbook/study the chapter slides: For each chapter covered, the first thing I recommend is to read both the chapter lecture slides in Canvas and the textbook.
- Watch the lecture videos. Each week has two or three lecture videos. These are recorded videos using voiceovers of lecture slides. I encourage you to view the videos at least once. However, each of you will develop a study method most suitable to you and some of you may find that studying the chapter slides is more effective.

- Practice, practice, practice! For each chapter covered, problems from the textbook will be selected as Work Problems. You are strongly encouraged to work on these problems as practice problems and then check the answer keys.

#### WEEKLY SCHEDULE

Week	Unit	Tasks
0	Preparations	1) Study carefully the course syllabus 2) Get and familiarize yourself with a PDF converter 3) Read Chapter 1 of textbook
1	Chapter 2	1) Read Chapter 2 of textbook 2) Review Chapter 2 notes 3) Study Chapter 2 lecture slides 4) Watch Chapter 2 lectures 1-3 5) Work on Chapter 2 work problems
2	Chapter 3 Chapter 4	1) Read Chapter 3 of textbook 2) Review Chapter 3 notes 3) Study Chapter 3 lecture slides 4) Watch Chapter 3 lectures 1-2 5) Work on Chapter 3 work problems 6) Read Chapter 4 of textbook 7) Review Chapter 4 notes 8) Study Chapter 4 lecture slides 9) Watch Chapter 4 lecture 10) Work on Chapter 4 work problems
3	Chapter 5	1) Read Chapter 5 of textbook 2) Review Chapter 5 notes 3) Study Chapter 5 lecture slides 4) Watch Chapter 5 lectures 1-3 5) Work on Chapter 5 work problems
4	Chapter 6	1) Read Chapter 6 of textbook 2) Review Chapter 6 notes 3) Study Chapter 6 lecture slides 4) Watch Chapter 6 lectures 1-2 5) Work on Chapter 6 work problems
5	Segment 1 Review and Test 1	1) Review Chapters 2-6 2) Take <b>Test 1</b> from <b>7pm-9pm on Thursday September 22</b>
6	Chapter 7	1) Read Chapter 7 of textbook 2) Review Chapter 7 notes

		<ul style="list-style-type: none"> <li>3) Study Chapter 7 lecture slides</li> <li>4) Watch Chapter 7 lectures 1-2</li> <li>5) Work on Chapter 7 work problems</li> </ul>
7	Chapter 8	<ul style="list-style-type: none"> <li>1) Read Chapter 8 of textbook</li> <li>2) Review Chapter 8 notes</li> <li>3) Study Chapter 8 lecture slides</li> <li>4) Watch Chapter 8 lectures 1-2</li> <li>5) Work on Chapter 8 work problems</li> </ul>
8	Chapter 9	<ul style="list-style-type: none"> <li>1) Read Chapter 9 of textbook</li> <li>2) Review Chapter 9 note</li> <li>3) Study Chapter 9 lecture slides</li> <li>4) Watch Chapter 9 lectures 1-3</li> <li>5) Work on Chapter 9 work problems</li> </ul>
9	Chapter 10	<ul style="list-style-type: none"> <li>1) Read Chapter 10 of textbook</li> <li>2) Review Chapter 10 notes</li> <li>3) Study Chapter 10 lecture slides</li> <li>4) Watch Chapter 10 lectures 1-3</li> <li>5) Work on Chapter 10 work problems</li> </ul>
10	Segment 2 Review and Test 2	<ul style="list-style-type: none"> <li>1) Review Chapters 7-10</li> <li>2) Take <b>Test 2</b> from <b>7pm-9pm on Thursday October 27</b></li> </ul>
11	Chapter 11	<ul style="list-style-type: none"> <li>1) Read Chapter 11 Sections 11.1-11.3 of textbook</li> <li>2) Review Chapter 11 notes part 1</li> <li>3) Study Chapter 11 lecture slides part 1</li> <li>4) Watch Chapter 11 lectures 1-3</li> <li>5) Work on Chapter 11 work problems part 1</li> </ul>
12	Chapter 11	<ul style="list-style-type: none"> <li>1) Read Chapter 11 Sections 11.4-11.5 of textbook</li> <li>2) Review Chapter 11 notes part 2</li> <li>3) Study Chapter 11 lecture slides part 2</li> <li>4) Watch Chapter 11 lectures 4-6</li> <li>5) Work on Chapter 11 work problems part 2</li> </ul>
13	Chapter 12	<ul style="list-style-type: none"> <li>1) Read Chapter 12 of textbook</li> <li>2) Review Chapter 12 notes</li> <li>3) Study Chapter 12 lecture slides</li> <li>4) Watch Chapter 12 lectures 1-2</li> <li>5) Work on Chapter 12 work problems</li> </ul>
		Thanksgiving Break: 11/22-11/28
14	Chapter 13	<ul style="list-style-type: none"> <li>1) Read Chapter 13 of textbook</li> <li>2) Review Chapter 13 notes</li> </ul>

	Chapter 14	<ol style="list-style-type: none"> <li>3) Study Chapter 13 lecture slides</li> <li>4) Watch Chapter 13 lectures 1-2</li> <li>5) Work on Chapter 13 work problems</li> <li>6) Read Chapter 14 of textbook</li> <li>7) Review Chapter 14 notes</li> <li>8) Study Chapter 14 lecture slides</li> <li>9) Watch Chapter 14 lecture</li> <li>10) Work on Chapter 14 work problems</li> </ol>
15	Segment 3 Review and Test 3	<ol style="list-style-type: none"> <li>1) Review Chapters 11-14</li> <li>2) Take <b>Test 3</b> from <b>7pm-9pm on Thursday December 8</b></li> </ol>

### **ACADEMIC INTEGRITY**

Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor or the [Office of Academic Integrity](#).

Students are expected to adhere to this honor pledge on all graded work whether or not they are explicitly asked in advance to do so: "I strive to uphold the University values of respect, responsibility, discovery, and excellence. On my honor, I pledge that I have neither given nor received unauthorized assistance on this work."

### **ACCOMMODATION OF DISABILITIES**

The goal of the University of Missouri is to ensure an inclusive learning environment for all students. [The University of Missouri Disability Center](#) provides services and accommodations for students to participate fully in the learning experience and to experience equitable evaluation of their performance. Students (including online students) with a documented disability can contact the Disability Center to establish an [Accommodation Plan](#). Documented disabilities include hearing, vision, mobility, learning and attention, psychological health, and physical health. Students' accommodations are implemented with the input of students to maximize the learning experiences. The MU Disability Center keeps information about a student's disability confidential.

Please notify me of your eligibility for accommodations as soon as possible. Additionally, if there are aspects of the course that present as barriers, such as inaccessible course content (e.g., learning assessments, PowerPoints, non-captioned videos, images, tables, PDFs) or if you need an immediate accommodation due to an injury, please contact me or the Disability Center as soon as possible.

### **INTELLECTUAL PLURALISM**

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the departmental chair or divisional director, the [Office of Academic Integrity](#), or the [MU Equity Office](#).

### **ACADEMIC INQUIRY, COURSE DISCUSSION, AND PRIVACY**

When students record something that happens in a course (a lecture, class discussions, meetings, etc.) it has an impact on the rights of the people captured in that recording. For example, the instructor and the University may have rights to the intellectual property contained in that recording. At the same time, another student who may have been recorded has the right to privacy. In order to protect these rights, MU employs a policy (called “Executive Order No. 38”) to govern both situations you may encounter while taking a course – when an instructor allows recordings and when they do not.

Instructors should inform students which applies to their course:

- In this class, students may not make audio or video recordings of course activity, except students permitted to record as an accommodation under section 240.040 of the Collected Rules.

If the instructor doesn’t specifically prohibit recording course activity, then the students are allowed to record and the same prohibitions regarding distribution apply.

Students who violate this policy are subject to discipline in accordance with provisions of section [200.020](#) of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

### **FERPA**

The Family Educational Rights and Privacy Act (FERPA) of 1974 is a federal law designed to protect the privacy of educational records; to establish the rights of students to inspect and review their education records; and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. The law applies to any individual who is or has been in attendance at an institution and regarding whom the institution maintains educational records. Once students have matriculated to the University of Missouri, i.e. enrolled in course work, FERPA rights transfer to the student, regardless of the student’s age.

Students can enable certain individuals to have access to their education records by signing a FERPA waiver. The consent must specify records to be disclosed, state the purpose of the disclosure and identify the party or class of parties to whom the disclosure must be made.

### **NONDISCRIMINATION POLICY**

The University of Missouri does not discriminate on the basis of race, color, national origin, ancestry, religion, sex\* (including gender), pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, and any other status protected by applicable state or federal law. Discrimination includes any form of unequal treatment such as denial of opportunities, harassment, and violence. \*Sex discrimination includes rape, sexual assault, sexual harassment, unwanted touching,

stalking, dating/domestic violence, stalking, and sexual exploitation. Retaliation for making or supporting a report of discrimination or harassment is also prohibited.

If you experience discrimination or sexual violence, you are encouraged (but not required) to report the incident to the MU Office for Civil Rights & Title IX. Learn more about your rights and options at [civilrights.missouri.edu](http://civilrights.missouri.edu) or call 573-882-3880. You also may make an anonymous report online.

If you are a survivor, or someone concerned about a survivor, and need immediate information on what to do, see RSVP Resources page. Both the Office for Civil Rights & Title IX and the RSVP Center can provide assistance to students who need help with academics, housing, or other issues.

In the event that you choose to write or speak about having experienced any of these forms of prohibited discrimination or harassment, Mizzou policies require that, as your instructor, I share this information with the MU Office for Civil Rights & Title IX. They will contact you to offer information about resources, as well as your rights and options as a member of our campus community.

### **MENTAL HEALTH**

The University of Missouri is committed to supporting student well-being through an integrated network of care, with a wide range of services to help students succeed. The MU Counseling Center offers professional mental health care, and can help you find the best approach to treatment based on your needs. Call to make an appointment at 573-882-6601. Any student in crisis may call or go to the MU Counseling Center between 8:00 – 5:00 M-F. After hours phone support is available at 573-882-6601.

Visit our website at <https://wellbeing.missouri.edu> to take an online mental health screening, find out about workshops and resources that can help you thrive, or learn how to support a friend. Download Sanvello, a phone app that teaches skills and strategies to help you maintain good mental health. Log in with your Mizzou e-mail to unlock all the tools available through Sanvello at no cost to you.

### **GRADE APPEAL/GRIEVANCE POLICY**

Information concerning student grade appeal procedures and non-academic grievances and appeals can be found at <https://registrar.missouri.edu/policies-procedures/grade-appeals.php>.

### **ONLINE CLASS NETIQUETTE**

In an online classroom, our primary means of communication is written language. The written language has many advantages: more opportunity for reasoned thought, more ability to go in-depth, and more time to think through an issue before posting a comment on the Discussion Board forum. However, written communication also has certain disadvantages, such as lack of the face-to-face signaling that occurs through body language, intonation, pausing, facial expressions, and gestures. As a result, please be aware of the possibility of miscommunication and compose your comments in a positive, supportive, and constructive manner.

### **ONLINE COURSE MATERIALS**

All online contents of this class are copyrighted and are not to be shared or used outside of this class.

### **LAST DATE OF ATTENDANCE AND IMPACT ON FINANCIAL AID**

Federal regulations for financial aid require the student financial aid office to document the attendance of students who have received federal financial aid if they do not successfully complete any courses during the term. As a result, the last day of attendance (or activity) for any student receiving an F, U, or FN in this course will be recorded in the grade roster and reported to the financial aid office. **Based on the last day of attendance, students may be required to repay a portion of their financial aid award for the semester.**

A student's last day of attendance (or activity) is the last day on which a student participates in an academically-related activity at the University. These include:

- Attendance in class, lab, or an instructor's office hours
- The completion of an assignment or examination
- An appointment with a professor or e-mail correspondence regarding course material
- (Online courses only) For online courses, the last day a student submits an assignment or exam. Only logging into an online class without participating is *not* acceptable for last day of attendance

Please note that discussing a course withdrawal or notifying the instructor of an absence in class does not constitute participation for financial aid purposes. Moreover, any office hour visits or email correspondence must be related to the course material.

### **RELIGIOUS HOLIDAYS & ACCOMMODATIONS**

Many religious faiths are represented in the student body. The University of Missouri does not restrict student free exercise of religion, unless 1) the restriction is in the form of a rule of general applicability, and does not discriminate against religion or among religions; and 2) it can be demonstrated that the application of the restriction is essential to furthering a compelling university interest, and is not unduly restrictive considering the relevant circumstance. The policy of the University attempts to strike a reasonable balance between accommodating the religious practice of students and meeting academic needs and standard.

Consult IDE's [Guide to Religions](#) for the form that can be used to notify an instructor of an absence associated with religious practice. Students are expected to notify their instructor(s) by completing and submitting this form in a manner that is consistent with the procedure outlined in the university's policy on student religious accommodation. Providing false information regarding sincerely held religious practice is a violation of the university's Standard of Conduct and will not be tolerated.