Economics 353: Microeconomic Theory
Fall 2022

Syllabus

September 1, 2022

Instructor:	Dr. Alexandr Moskalev
	(he/him/his)
	moskalev@oberlin.edu

Class:	Tuesday & Thursday, 3:00 pm to 4:15 pm, King 243

Office Hours: Monday 5 - 6 pm, Rice Hall 210   *and by appointment.*
Tuesday 12:30 - 1:30 pm, Rice Hall 210
Wednesday 5 - 6 pm, Rice Hall 210

Please check https://alexmoskalev.com/officehours for any changes and to request an appointment.

Course Description: This course is meant to introduce students to topics and problems they could see during the first year of an Economics Ph.D. program. We will cover the theory of the firm and consumer, the effects of uncertainty on optimal decisions, a few game theory concepts, dynamic programming, and microeconomics of imperfect information.

Learning Goals:

- To understand the theory behind models of consumer behavior, firm behavior and game theory.

- To master algebraic and calculus tools needed to work with these models.

- To apply concepts to new and possibly unfamiliar real-world situations.

- Translate information into a formal system or mathematical model; translate real world phenomena into formal/mathematical symbols.

- Use formal reasoning/mathematical methods, tools, technology, and calculation to solve problems.

- Make judgments and draw appropriate conclusions based on the quantitative and/or formal analysis of data.

Prerequisites: The course features extensive use of linear algebra, multivariate calculus, and microeconomic theory (at intermediate level). I expect you to be proficient with the material covered in those courses (Econ 253, Math 231, Math 232) and to be able to review your notes/lectures/books if needed. The Mathematics Background appendix in the course textbook should give you an idea of Math level we will be using in this class.

Readings: The topics in this course are closely aligned with the book *Microeconomics: Principles And Analysis* (Oxford University Press, 2005) by Frank Cowell. This is a required reading for this course. The

book presents material in a concise manner with a great use of diagrams, contains a robust mathematical appendix, and provides a nice selection of problems for a reader.

Grading: Letter grades will be based on a curve of students' total points. The curve will be based on what I deem an appropriate reflection of students' performance.

I will use the following components for grading purposes:

20%	🏠	Homework
30%	📝	Midterm
40%	📜	Final
10%	⭐	Class participation

Homework: It will consist of 4 problem sets. To accommodate possible absences due to illness or other unforeseen factors, I will drop the lowest score. A non-submitted assignment results in a zero grade for it. Homework assignments are meant to give students exposure to the different types of problems in the field. A diligent work on homework assignments typically pays off in a better exam experience.

Class participation: Several components will be counted towards class participation points. Points earned by a student under class participation category will be capped at 10 (10% of the course grade).

- *Lecture attendance.* To measure lecture attendance and material comprehension, I will conduct occasional pop-up quizzes that will include a few basic questions/problems based on recently covered material. The quizzes will be "take-home" and due the same day. I will distribute unique *quiz-credit-codes* at respective lectures to identify students present. The quiz solution must be submitted alongside a valid *quiz-credit-code*. The maximum per quiz is 3 points. Submissions from students who missed the corresponding lecture are not eligible for credit unless they declared missing the corresponding lecture ahead of time using the procedure described below.

- *Helping fellow classmates.* Students will receive non-credit study points that they can transfer to other students at their will when possible. This is meant to reward students who are helping other students with the course material and to improve opportunities of getting help. Points will be credited towards receiving party's class participation score using the posted conversion rate at the moment of the transfer and a non-linear tranformation shown below. Some transfers may not be possible: in particular, a student cannot transfer points to another student from whom any amount of points was received during the past 7 days. While all students will receive non-credit study points, low-performing students will receive a greater amount to have a higher chance of getting help. This subcategory is capped at 4 class participation points per receiving party in total.

- *Math bootcamp.* Two points for class participation may be assigned for attending Economics Math Bootcamp hosted by Hannah Kris.

- *Missed Lectures.* Missing lectures is a behavior that is not conducive of good learning outcomes. On top of losing a learning opportunity, this behavior creates other negative externalities (e.g. likely losing participation points). In this course you will be able to declare that you will miss a certain lecture ahead of time. If you do so and there is a quiz, then you will be given an opportunity to take it during the same day. If you don't

Non-linear transformation
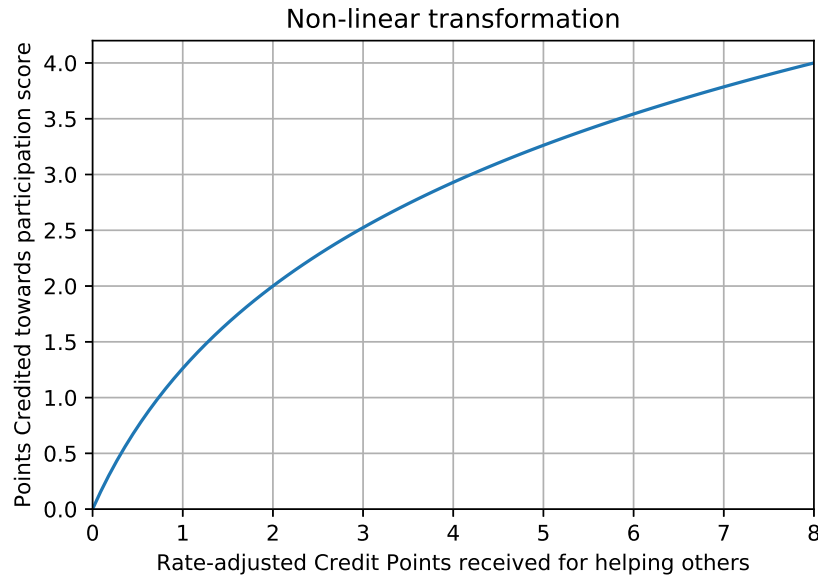
declare, don't go, and there is a quiz, then you won't be able to receive any credit for it. To accommodate rare reasonable absences, you may be able to declare up to 4 missed lectures with reasonable cause(s) without a participation score penalty. Every additional lecture that you declared missing, regardless of the reported cause, will carry a penalty of 1 participation point.

You need to declare missed lectures using the automated system provided via the electronic platform referenced below. Please do not send emails about missed lectures as those can get lost, can be read too late for you to take your quiz that day (there are no extensions for quizzes), and cannot be automatically accounted towards the 4 lectures that you can miss (therefore, I will have to subtract the penalty directly from your participation score even if you missed less than 5 lectures). Once you declare a missed lecture, you should visit the same page again the day of the lecture after it is over to check if a quiz was posted. No email notifications will be made.

Schedule: This is an approximation of the desired schedule. Actual topics and their dates may vary depending on how quickly we progress through the material.

Introduction	
Sep. 1 ⚠ *Learning Portal Registration*	Introduction; Optimization 📖 A.7
Sep. 6	Constrained Optimization; Inequality Constraints 📖 A.7
Sep. 8	Envelope Theorem 📖 A.7

The Firm

Sep. 13 Technology; Marginal Rate of Technical Substitution; Elasticity of Substitution

📖 Chapters 2.1-2.2

Sep. 15 Homotheticity; Returns to Scale; Marginal Product

📖 Chapters 2.1-2.2

Sep. 20 Cost Minimization; Hicksian Demand

📖 Chapters 2.1-2.2

Sep. 22 Cost Function and its Properties

📖 Chapters 2.1-2.2

Sep. 27 Optimal Choice of Output; Cost Curves

📖 Chapters 2.1-2.2

Sep. 29 Comparative Statics
⚠️ *HW 1 Due* 📖 Chapters 2.3

The Consumer

Oct. 4 Consumer Environment; Preference Representation

📖 Chapters 4.1-4.3

Oct. 6 Axioms of choice; Weak Axiom of Revealed Preferences;

📖 Chapter 4.4

Oct. 11 Consumer Optimization; Cost Minimization; Utility Maximization

📖 Chapters 4.5

Oct. 13 Comparative Statics; Welfare

📖 Chapters 4.6

Uncertainty and Risk

Oct. 25 Consumption Decisions under Uncertainty; Certainty Equivalent;

📖 Chapters 8.1-8.2

Oct. 27 Preferences under Uncertainty; von Neumann-Morgenstern utility function

📖 Chapters 8.3

Nov. 1 Risk Aversion and Lotteries
⚠️ *HW 2 Due* 📖 Chapters 8.4-8.5

Nov. 3 Trade, Individual Optimization

📖 Chapters 8.6-8.7

Midterm	
Nov. 8	Review before the Midterm
Nov. 10	Midterm in class

Strategic Behavior	
Nov. 15	Game Theory concepts; Nash Equilibrium in Pure Strategies 📖 Chapters 10.1-10.2
Nov. 17	NE in Mixed Strategies; Bayesian Nash Equilibrium 📖 Chapters 10.3-10.4
Nov. 22	Subgame Perfect Nash Equilibrium; Sequential Rationality 📖 Chapter 10.5
Nov. 29 ⚠ *HW 3 Due*	Weak Perfect Bayesian Nash Equilibrium; Finite Horizon Games 📖 Chapters 10.5-10.6
Dec. 1	Infinite Horizon Games 📖 Chapters 10.5-10.6

Information	
Dec. 6	Adverse Selection 📖 Chapters 11.1-11.3
Dec. 8	Signaling 📖 Chapters 11.2-11.3 *(if time permits)*
Dec. 13 ⚠ *HW 4 Due*	Signaling 📖 Chapters 11.2-11.4 *(if time permits)*

Final Exam	
Dec. 21 ⚠ *Final Exam*	Final Exam (in-person, non-cumulative), 7:00 – 9:00 pm *please follow the announcements for location details*

Problem Sets: Problem sets and other graded assignments must be submitted electronically using https://students.alexmoskalev.com/ platform unless stated otherwise. You should have received your login instructions during the first lecture.

Please keep in mind the following instructions regarding problem sets, quizzes, and other online assignment submissions.

⏰ Please allow yourself enough time to submit the assignment. Uploads may be slow. Late assignments will incur 1-point-per-minute-of-delay penalty regardless of the reason.

⏱ The assignment submission time is the timestamp of the latest upload for that assignment. You may leave empty slots if you have not solved all parts of the assignment.

🔴 Unless stated otherwise, only valid PDF-format files will be accepted. There is no explicit limit on file size, but you should keep your files under 32 MiB to ensure that uploads will not fail too often.

⏳ Extensions can only be granted before the deadline. You should use the electronic platform to apply for an extension. Some assignments cannot be extended. Assignments that can be extended will have a respective message if you have a positive extension balance.

✳️ You should follow the prompted structure of a submission. For example, problem sets should be submitted problem-by-problem (separate files). This simplifies grading and saves time for the grading party. I and the teaching assistant may disregard all problems that were submitted using a wrong slot as well as submissions that include problems that should have been submitted elsewhere.

✏️ Please write legibly. Any hard-to-read part of a submission may not receive credit.

🔧 If you think that something is broken, you should immediately contact me with the description of what is broken. Be ready to promptly respond to clarifying questions and to provide some technical details. If you delay, you may lose points for your submission or other activity that was interrupted.

🚏 The system is monitored to ensure accurate measurement of submissions' timestamps.

If a problem set or other graded assignment has a solution key posted, students should review their submissions to identify areas where they might benefit from seeking help at office hours and review sessions. Being proactive and reaching out soon if you need help pays greatly when the exam time comes.

If a problem set or other graded assignment is submitted in an alternative way without a prior approval (e.g. a problem set being emailed instead of being uploaded), then a 30% score deduction can be applied to that assignment. Submissions made in an irregular way lead to delays in grading, misplaced papers, lost files, and unnecessary extra time being spent on tracking them down for grading. Therefore, it's best to follow a single systematic way.

Problem Sets Extensions: Some graded assignments will have an option to be extended for a valid reason. Each student will be granted a balance of 8 assignment-extension-days. All extensions must be processed electronically and prior to the deadline at https://students.alexmoskalev.com/. There is no need to email me about that, I will eventually review the extensions' reasons you've provided. If an assignment is extendable and you have a positive balance of assignment-extension-days, you will see a respective option next to the assignment. Concurrent extensions will use the credit separately. Once you used all assignment-extension-days, you will not be able to extend any assignments. Please use the balance wisely.

Midterm Regrade Requests: For the midterm, you must submit a regrade request within 10 days of distributing the graded midterm workbooks in class. After carefully reviewing the posted midterm solutions and comparing it to what you have written directly in your midterm, you must provide a three-paragraph explanation: one paragraph detailing how your written answer is similar to the posted solutions, another paragraph detailing how your written answer differs from the posted solutions, and a final paragraph explaining why the awarded points do not accurately reflect your score. Your regrade request must be submitted to me in hard copy. After submission, I will reply within a week to your regrade request in an email. I also may decrease the number of points awarded on your exam to accurately reflect your score if I discover that some parts were mistakingly given points.

Midterm Make-Up: No make-up midterms will be offered. Please be aware that midterm dates are set well in advance and are available in this Syllabus. The current plan is to have in-class midterms, so I assume that you are available during the respective dates/times. If at the start of the term you have

travel plans preventing you from taking a midterm, I suggest you to drop this class or change your travel schedule. Travel schedule conflicts (including last minute changes/reservations) are not considered valid excuses.

A missed midterm will result in a zero point score for it. In an exceptional circumstances with a valid excuse, I may consider reweighing your Final Exam score to partially account for a missed midterm.

My Role as Instructor: As an Instructor, I am not only responsible for helping you understand economic concepts, I am also an advocate in place to protect and enhance your learning experience. If there are issues with any parts of the class (and especially with parts that may be changed quickly and easily), please let me know.

Email Communication: I will try to respond to emails within 48-hour period during work days. To ensure that your emails are going to be marked correctly and processed smoothly, please send those from your @oberlin.edu address. Be aware that during the days immediately before any midterm or exam you may not get a timely response from me due to peaking number of emails. Please plan and study ahead. Before sending an email to me, check the course syllabus thoroughly (use the latest online version to find TBD/TBA information). In a case of multiple emails from one person in a short period of time or a difficult question asked, I also reserve a right to transfer the conversation to office hours.

I assume that emails sent to your @oberlin.edu address are read in a timely fashion. You may receive class-wide notifications as well as individual messages related to class activities, assignments submitted, midterms/final exam arrangements, etc. I also assume that your email box is secure, since messages may contain details about your performance in the course and personal links to access course-related resources.

Electronic Devices: Please refrain from the use of cell phones, tablets, laptops, and any other electronic devices during the class time. You should also switch your devices into silent mode. Students with documented disabilities may receive a permission to use a device that is instrumental to their learning. Photography, voice, or video recordings of the class are not permitted without the instructor's consent.

Honor Code: Academic Integrity is of utmost importance for maintaining a high-trust Academic Environment. I expect all students to be familiar with and follow Oberlin's Honor Code.

Religious Holidays: I adhere to Oberlin's Religious Holiday Observance Policy. Please let me know about any schedule conflicts that might affect your activity in this class as soon as possible.

Students with Disabilities: If you have a disability that requires an accommodation, please let me know as soon as possible. You will need to arrange for it through the Student Accessibility Services. Please contact the Student Accessibility Services right away to start the documentation process. If you substantially delay your request, I may not be able to make necessary arrangements.

Disclaimer: I may adjust the syllabus if I believe it will serve the learning needs of the class. During the term, I may make statements about specific assets and asset classes, economic phenomena, behaviors of markets, firms and individuals, give opinion in relation to current/past events, and, among other things, discuss how certain situations will evolve or could have evolved under different sets of circumstances. Any information, idea, opinion, or other impression you get from this class should only be used for subject learning purposes and should not be considered an advice.

Acknowledgements: I'm grateful to Viplav Saini for his assistance in preparation of this course. This and other course-related documents may use Emoji graphics licensed under CC-BY 4.0: https://creativecommons.org/licenses/by/4.0/ Copyright 2022 Twitter, Inc and other contributors.