ECON 3030: Intermediate Microeconomic Theory
Cornell University, Spring 2019
Tues/Thurs, 10:10am–11:25am
Goldwin Smith Hall G-64 (Kaufmann Auditorium)

Instructor

Douglas McKee (douglas.mckee@cornell.edu)
Office: 466 Uris Hall
Office Hours: Thursday, 3:00pm–4:30pm

Teaching Assistant

Maura Coughlin (mc2463@cornell.edu)
    Section 210: Friday, 9:05am-9:55am, Goldwin Smith Hall G22
    Section 211: Friday, 10:10am-11:00am, Goldwin Smith Hall G22
    Office Hours: Monday, 10:30am-12:00pm and Wednesday, 3:00pm–4:30pm, Uris 488

Course Description

Everyone entering this class should be familiar with the concepts of preferences, maximization, technology, markets, and strategic interaction from previous coursework. Here, we will use the tools of calculus, constrained optimization, and game theory to put a formal mathematical foundation under these ideas. This will let us model more complex markets and relax assumptions (such as linearity) that are commonly made in introductory classes. Substantive topics will include consumer preferences and utility; demand relationships among goods; labor supply; uncertainty and risk; production and costs; welfare; behavior of firms; monopoly; price discrimination; public goods and externalities; asymmetric information; signaling; moral hazard and adverse selection.

This course will motivate the analysis of economic concepts using case studies and empirical facts. For most of the class we will assume actors behave as if they maximize an objective function. Depending on whether actors are firms, people, or governments, such functions may represent the level of profits, happiness or social welfare. The academic objective of this course is to elaborate students' skills in using theoretical tools to formulate and solve economic problems. The broader goal is for students to gain a deep understanding of the economic aspects of individuals' and firms' decisions.

The prerequisites for this course are introductory economics (ECON 1110/1120) and familiarity with single variable calculus (MATH 1110). Some experience with partial derivatives (e.g., MATH 1120) is helpful but not required.

Grades

Your grade for the class will be composed of four parts:

<u>1. Problem Sets</u> (20%)
There will be 6 problem sets during the semester. You may pass in the problem sets as pdf's through the course web site by 10:10am or in person at the beginning of class on the due date. Your grade on each problem set will be based primarily on your answers to two randomly selected questions, but I will also expect you to submit answers to all the questions. Complete solution sets will be posted in the evening after the problem sets are due, and it is your responsibility to read these solutions and make sure you understand them. Your lowest grade on a problem set will be dropped. **Late problem sets will not be accepted, including those turned in after class on the due.**

<u>3. First Prelim Exam</u> (25%)
Date: Tuesday, February 19 in class

<u>4. Second Prelim Exam</u> (25%)
Date: Thursday, March 21 in class

<u>5. Final Exam</u> (30%)
Date: Saturday, May 11 at 2:00pm

Exams are closed book, but you may bring one double-sided page of notes to the first prelim, two pages to the second prelim, and three pages to the final exam. You may use calculators during the exams.

Final grades for the class will be determined by computing a weighted score based on the weights listed above. The weighted scores are assigned letter grades A-B-C at proportions of 35-35-20 percent. The remaining 10 percent is spread across the letter grade distribution (including D and F) at the discretion of the instructor. No more than 5% of students (and likely less) will get A+'s.

<u>Excuses</u>

Because one problem set is dropped, I do not consider excuses for missed problem sets. The only exception is prolonged/severe illness, which must be handled through the advising deans as per case (1) below.

With respect to exams, the Faculty Handbook
(http://theuniversityfaculty.cornell. edu/handbook/Chapter5.pdf) lists four types of situations in which faculty are encouraged to make accomodations for missed work. However, the determination as to whether a particulary case warrants accomodation is ultimately the decision of the faculty member. Here is how the four cases are handled in this course:

1. Illness, or family or personal emergency: Any situations that fall under this category must

be first brought up with the advising dean in the student's college. The advising dean will then contact me directly, and I will make a determination based on the particular case. Do not email me directly about these issues.

2. Employment interviews. The student must provide me evidence of the interview and establish that (s)he has no control over the timing of the interview.

3. Religious observances. While I do my best not to schedule exams during religious holidays, please contact me at least two weeks in advance if an exam date/time conflicts with a religious holiday.

4. Athletics and Extracurricular Activities. Students in varsity athletics or recognized extracurricular activities must provide the standard permission slip from the staff responsible for the activity at least two weeks before the exam.

Final Exam Conflicts

There are two situations that I will consider for exam conflicts. First is a direct conflict where ECON 3030 and another class appear on the registrar's exam schedule at the same time. Second is more than 2 exams in 24 hours. This is defined as 3 or more exams having a start time within 24 hours, as indicated on the registrar's exam schedule. If Exam 1 is on Monday at 2pm, Exam 2 is on Monday at 7pm, and Exam 3 is on Tuesday at 2pm, this is not more than 2 exams in 24 hours. If you have a conflict, you need to email me at least 2 weeks before the final exam, listing out the other classes involved and scheduled exam times. The date and time of the makeup is determined by me.

Grading FAQ

- **Are the tests cumulative?** The tests **are** cumulative. About 15% of the second prelim is on earlier material and up to half the final exam is on material covered on the first two prelims. In addition, you will need to use concepts from the earlier parts of the course in order to understand the later topics.

- **Is there extra work I can do to improve my grade?** No.

- **I didn't do as well as I had hoped early in the course. In determining my final grade, can you put more weight on the latter part of the course?** No.

- **I have X exams/assignments due within Y of each other. Can I reschedule the exam/hand in the homework late?** No. All of the exam dates are listed above giving you plenty of time to plan ahead. As noted above, the only exception is more than 2 finals in 24 hours.

Exam Regrades

While we take care to grade exams as fairly and consistently as possible, on rare occasions there may be grading mistakes. If you feel that your test has been graded incorrectly, you must

submit it to the professor (not the TA), along with an explanation of the issue in writing. You must do this within 2 weeks of the exam being returned (not the date you pick it up) for it to be regraded. The entire exam will be regraded, and as a result it is possible for your grade to go down as well as up.

Acceptable Use Policy

You are free to use any published materials (e.g., another textbook), in preparing Econ assignments or for learning the material more generally. You are also strongly encouraged to work with others in your class. This is particularly helpful for learning to program. Each person must turn in their own assignment.

The use of any solution materials prepared in a previous year for ECON 3030, other than materials distributed this academic year by the course faculty, is strictly prohibited. This includes 1) any notes or handouts distributed by an instructor in a prior term of ECON 3030; and 2) any notes or solutions prepared by former students of Econ 3030, in either written or electronic form.

This policy means you should not solicit or use solutions to previous years' problem sets. The reason for this policy is that access to previous years' materials can create serious inequities between fellow students, and jeopardize the integrity of the academic environment. Academic disciplinary actions will be taken against those who violate this policy.

Text and Readings

The required textbook for this course is *Microeconomic Theory: Basic Principles and Extensions*, by Walter Nicholson and Christopher Snyder. You may use either the latest (12th) edition (available on Amazon for $19.54) or the previous (11th) edition which can be found for even cheaper. Be careful not to accidentally purchase their much less mathematically-oriented book: Intermediate Microeconomics and Its Application.

There are several other excellent intermediate micro textbooks on the market, and you may want to look at one or two during the semester to get a different perspective on the material:

- Varian's *Intermediate Microeconomics: A Modern Approach* comes in a version with and without calculus.

- Nechyba's *Microeconomics: An Intuitive Approach with Calculus* covers each topic informally and then again formally (with calculus)

- Perloff's *Microeconomics: Theory and Applications with Calculus* is probably the most entertaining of the intermediate micro books, but the bar is pretty low.

The readings for this course are about mathematical techniques and the "big picture" ideas that underly them. They are not bed-time reading. Take your time to do the assigned reading for each class, and make sure you understand what is being presented. Preparation for class also means working through some of the review exercises at the end of the assigned chapters.

Acknowledgements

Much of this class is derived from the intermediate microeconomics classes that Larry Samuelson and Eva Chalioti taught recently at Yale. I'm extremely grateful to them for sharing their syllabi, lecture slides, assignments, handouts, exams, and advice. In addition, Gregory Besharov and Max Troshkin have generously shared materials that they have used in teaching this course in the past. All of these have provided a fantastic starting point. That said, I take full responsibility for any mistakes that I may have added to the material.

Please do not redistribute any of these materials without my permission.

Schedule

PART I: INDIVIDUAL CHOICE

Module 1: The Big Picture

  Lecture: January 22

    Read: NS (Nicholson and Snyder) Chapter 1

   Topics: – Course overview
           – Preferences and utility functions
           – Budget constraints
           – Optimization

Module 2: Optimal Choice

  Lecture: January 24 and January 29

    Read: NS Chapter 2 and 3

   Topics: – Single variable optimization
           – Multi-variable optimization
           – Lagrangians
           – Budget Constraints
           – Preference Relations
           – Utility Functions
           – Indifference curves and utility

Module 3: Demand

  Lecture: January 31 and February 5

     Due: Problem Set 1 on February 5, 10:10am

    Read: NS Chapter 4

   Topics: – Homogeneous functions
           – Cobb-Douglas utility functions
           – Constant elasticity of substitution (CES)
           – Deriving demand functions
           – Price elasticity of demand
           – Income elasticity of demand

Module 4: Expenditures, Income Effects, and Substitution Effects

  Lecture: February 7

    Read: NS Chapter 5

   Topics: – Expenditure minimization

        – Substitution effects

        – Income effects

        – Slutsky equation

        – Marshallian (ordinary) demand vs. Hicksian (compensated) demand

Module 5: Consumer Welfare and Taxes

Lecture: February 12

  Read: NS Chapter 5 (section on Consumer Surplus)

Topics: – Consumer surplus

        – Compensating variation

        – Taxes

Module 6: Review

Lecture: February 14

  Due: Problem Set 2 on Febrary 14, 10:10am

Tuesday, February 19, 10:10am in class: FIRST PRELIM EXAM

Part II: FIRMS

Module 7: Profit Maximization

Lecture: February 21 and February 28

  Read: NS Chapter 9, 10, 11

Topics: – Production functions

        – Marginal product

        – Marginal rate of technical substitution (MRTS)

        – Returns to scale

        – Profit maximization vs cost minimization

        – Fixed vs variable costs

Part III: COMPETITIVE MARKETS

Module 8: Partial and General Equilibrium

  Lecture: March 5 and 7
      Due: Problem Set 3 on March 5, 10:10am
    Read: NS Chapters 12 and 13
  Topics: − Perfect Competition
            − Short run vs long run
            − Aggregate supply
            − Economic efficiency
            − Edgeworth Box
            − Walras' Law
            − Contract curve

Module 9: Welfare and Production Economies

  Lecture: March 12 and 14
    Read: NS Chapter 13
  Topics: − First and second welfare theorems
            − Production Possibility Frontier (PPF)

Module 10: Review

  Lecture: March 19
      Due: Problem Set 4 on March 19, 10:10am

Thursday, March 21 at 10:10am in class: SECOND PRELIM EXAM

PART IV: MARKET FAILURE

Module 11: Monopoly and Oligopoly

  Lecture: March 26 and 28
    Read: NS Chapters 14 and 15
  Topics: − Market power
            − Markets with one firm vs few firms
            − Price discrimination

Module 12: Imperfect Competition and Externalities

  Lecture: April 9 and 11

     Due: Problem Set 5 on April 9, 10:10am

   Read: NS Chapters 15 and 19

  Topics: − Cournot competition vs Bertrand competition
         − Differentiated products
         − Positive and negative externalities
         − Policy responses to externalities
         − Excludability and rivalry
         − Public goods

Module 13: Uncertainty and Insurance

  Lecture: April 16 and 18

   Read: NS Chapter 7

  Topics: − Risk and probabilities
         − Expected utility
         − Risk aversion
         − Choice under uncertainty
         − Cost benefit analysis under uncertainty
         − Insurance markets
         − Risk pooling

Module 14: Game Theory

  Lecture: April 23 and 25

   Read: NS Chapter 8 (up to Mixed Strategies)

  Topics: − Basic Concepts
         − Nash Equilibrium
         − Mixed Strategies

Module 15: Information

  Lecture: April 30 and May 2

   Read: NS Chapter 8 (Section on Signaling) and Chapter 18

  Topics: − Signaling
         − Adverse Selection
         − Moral Hazard

Module 16: Review

  Lecture: May 7

     Due: Problem Set 6 on May 7, 10:10am