Microeconomic Theory II

ECON 7010 R01

Spring 2022

When and where do we meet?

Classes meet W, 5:30PM to 7:20PM ET in Dealy 308.
Recitations meet W, 7:30PM to 8:30PM ET in Dealy 112.

Who is the professor?

Sean M. Collins, Ph.D., `http://smcollins.net`.
Reach at `scollins15@fordham.edu` or (646) 312–8270.
Appointments at `http://appointments.smcollins.net`.

Recitations with Jinghan Kuo, `jkou5@fordham.edu`.

What's in this syllabus?

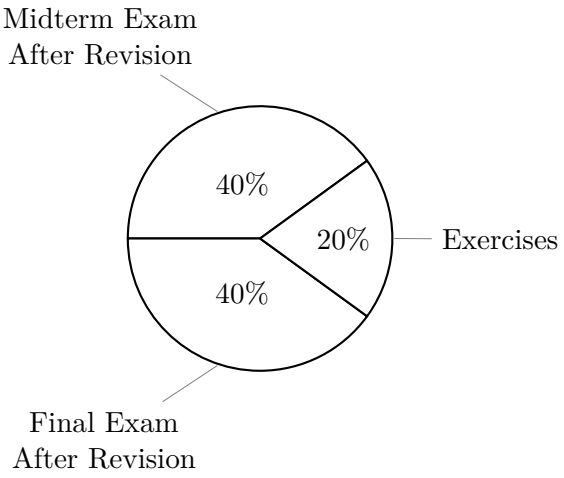
What are the highlights?

- Micro Theory II surveys consumer choice, the firm, general equilibrium, and markets (page 2).
- We cover in-depth eleven core chapters of the Mas-Colell, Winston, and Green (1995) text (page 3).
- Class meetings are interactive lectures accompanied by readings and exercises (page 4).
- On most weeks exercises are assigned to be finished over the following week as homework (page 4).
- There are two equally weighted exams, graded blind, each covering half the course (page 4).
- You have an opportunity to revise anything you missed on an exam to earn points back (page 4).

What are the important dates?

March 9th	Midterm Exam
March 16th	Spring Recess (No Class)
May 4th	Final Exam
May 11th	Exam Revisions Due

How is my grade calculated?



About This Course

Description

Microeconomic Theory II covers the foundations of contemporary microeconomic theory at the advanced graduate level. We develop an axiomatic model of static consumer choice, then add uncertainty and the ability to make tradeoffs through time. We further consider the underpinnings of production and outcomes of (often strategic) interaction of firms and consumers, and limiting cases. Although all capable and interested students are welcome, the course will focus on preparing Ph.D. students for their comprehensive exam in microeconomic theory.

Assistance

I believe in the Jesuit approach to education, and I hope that my respect for you and your potential will be reflected in your experience both inside and outside of the classroom.

Most students find this course to be challenging. I care about your personal and academic well-being, and I want you to succeed. Acknowledging that my help alone can only supplement time spent engaged in class meetings, working through exercises, reading, and studying; I invite you to seek help when you want it.

I am reachable via email at `scollins15@fordham.edu` and office phone at (646) 312–8270. I typically check my email and voicemail at least once every weekday. During the week, you should expect a reply within 36 hours.

I am available for online office hours by appointment. To secure an appointment, reserve a time in advance at `http://appointments.smcollins.net`. I take daytime and evening appointments and provide extra hours in advance of exams. As time is limited, please try make the most of it by preparing in advance with specific questions.

Course Materials

Textbook

There is one **required** textbook, Mas-Colell, Winston, and Green (1995), hereafter MWG, which despite its age remains the standard comprehensive microeconomic theory textbook for Ph.D. programs.

1. Mas-Colell, A., Winston, M., and Green, J. (1995). *Microeconomic Theory*. ISBN: 9780195073409. `https://global.oup.com/ushe/product/microeconomic-theory-9780195073409`

Because of the density and sparse contextualization of MWG, I **strongly recommend** that students pick up a more readable text by Jehle and Reny (2011) in addition to lecture notes by Nolan Miller (2006).

2. Jehle, G., and Reny, P. (2011). *Advanced Microeconomic Theory*, 3rd Edition. ISBN: 9780273731917. `https://www.pearson.com/uk/educators/higher-education-educators/program/.../PGM1012750.html`
3. Miller, N. H. (2006). *Notes on Microeconomic Theory*. `https://nmiller.web.illinois.edu/notes.html`

Although I suspect that most students will find the above resources adequate, there are a couple of other graduate-level texts that might help round out one's understanding, most notably Kreps (1990) and Varian (1992).

4. Kreps, D. M. (1990). *A Course in Microeconomic Theory*. Princeton University Press. ISBN: 9780691042640. `https://press.princeton.edu/books/hardcover/9780691042640/a-course-in-microeconomic-theory`
5. Varian, H. R. (1992). *Microeconomic Analysis* (Vol. 2). New York: Norton. ISBN: 9780393957358. `https://wwnorton.com/books/9780393957358`

Hardware and Software

Students will need regular access to an Internet-connected device such as computer, tablet, and/or smartphone.

Coursework may be submitted on Blackboard or in class on desiwgnated due dates. To submit coursework on Blackboard, students may need word processing or document scanner software capable of creating files in Portable Document Format (`*.pdf`).

Coursework and Grading

Blackboard

The central hub for course content and communication is Blackboard. To access, sign in with your Fordham credentials at `https://fordham.blackboard.com`.

Between classes, please check your email or Blackboard at least once every weekday for course announcements.

Class Meetings

Class meetings will be interactive lectures interspersed with questions and answers, meant to introduce and complement weekly readings and exercises.

Attendance is always expected, but we are all subject to circumstances outside of our control. I have attempted to arrange this course to encourage and reward attendance and participation, but also to provide the structure and tools to facilitate your success in the event of occasional absence.

Absences for reasons of religious holidays, death in the student's immediate family, or required participation in a University-sponsored event are, with the appropriate documentation, excused absences. **Absence for illness will be excused without documentation; please stay home if you feel ill.** In the event of an excused absence, students may make arrangements to promptly make up missed exams.

Exercises and Reading

Exercises are meant to be completed as homework. Typically, exercises will be due at the end of the week following the one during which they are assigned, and may be submitted or in person at the end of class on the due date. (Exercises should be submitted electronically in the event of absence.)

Weekly reading assignments are meant to supplement and "round out" the lectures. While you should do what you anticipate will work best for you, I recommend that you complete the reading after attending class.

Exams

There will be two exams, a midterm and final, each covering approximately half of the course material. Although the final exam is not *directly* cumulative, it may depend *indirectly* on mastery of concepts covered by the midterm.

Exams will be "closed book and non-collaborative" and taken during the scheduled class meeting. Exams will be graded anonymously, with an "exam code" used in lieu of your name.

Exams may cover any material from the lectures, exercises, and required reading. Exams will combine short answer and quantitative questions. Students will be expected to solve problems, do simple proofs, and explain concepts.

Revisions

Following each exam, students will have the opportunity to recover lost points by revising the answers to questions answered incorrectly or left blank.

For each point lost on an exam, students may recover some fraction through revision. For each question on which points were lost, satisfactory revisions consist of: (1) the correct answer to the question with complete explanation; and (2) an explanation of how you arrived at that answer from the original answer, including if applicable citation of any sources referenced. To complete revisions you make may use of course materials like notes, exercise answers, and the textbooks, but not the direct aid of your peers. Non-collaborative non-course sources may be used if properly cited. Questions for which revisions contain errors or for which citation/explanation is warranted but omitted may be awarded no credit.

If, in the course of reviewing or revising your graded exam, you find that I have made an error or misunderstood your answer to a question, I invite you to make a written appeal on your exam revision, and I strongly encourage you to directly discuss these concerns with me. Grades not appealed in this manner are final.

Submissions

Exercises and exam revisions may be submitted at the end of class meetings as hard copies or electronically on Blackboard when attached as a Portable Document Format (`*.pdf`) file.

Mainstream word processors (Microsoft Office, Google Docs, Apple Pages) and scientific typesetting systems (LaTeX) can export to `*.pdf`. Alternatively, you might convert handwritten work to `*.pdf` using a scanner or a camera-equipped device with Microsoft Office Lens (Android, iOS, or Windows), Google Drive (Android), or Apple Notes (iOS).

Grading

Grades in this course are determined by two exams and eleven exercises. The final grade is determined from a weighted average with each of the two revised exams weighted at 40% of your grade and exercises at 20%.

Exercises will receive full credit (100%) when the work is satisfactory and submitted by the Monday following the due date. If unsatisfactory or not submitted by the Monday following the due date, the grade will instead be replaced by the post-revision grade on the subsequent exam.

Because a missing exercise only changes the weights in your grade instead of "counting against" you, exercises will only be accepted for credit until the Monday following their due date, irrespective of the reason they were not submitted on time. The circumstances surrounding exam absences or late revisions will be evaluated on a case-by-case basis; a penalty (up to and including forfeiting all credit) may be applied if unexcused.

Grades will be based on individual performance with the scale below as a guide. All students' grades will be calculated using an identical formula. No individualized extra credit will be given.

		A	$93-100\%$	A−	$90-92\%$	Excellent
B+	$87-89\%$	B	$83-86\%$	B−	$80-82\%$	Satisfactory
		C	$70-79\%$			Unsatisfactory
		F	$\leq 69\%$			Failure

The drop/add period ends on January 26th. The last day to change to withdraw without incurring a WF or change to an audit is April 22nd.

Policies and Procedures

Academic Integrity

All students are expected to be familiar with the GSAS Academic Integrity Policy and adhere to it. Plagiarism, cheating, falsification, unapproved collaboration, and other violations will not be tolerated. Exam answers and exam revisions are expected to be entirely your own work. If you suspect that academic dishonestly has occurred, please notify me promptly and privately.

Accomodations

We all learn differently, and so all need some accommodations to learn effectively. If you have a documented disability and, as a result, need specific types of accommodation to participate in this class, complete course requirements, or benefit from the University's programs or services, contact the main Office of Disability Services (ODS) at `disabilityservices@fordham.edu` or (718) 817–0655. ODS works with students confidentially and does not disclose any disability-related information without their permission. Accommodations are not retroactive, so you need to register with ODS prior to receiving your accommodations.

Health and Safety

We all experience emotional distress and personal difficulties as a normal part of life. As your instructor, I am not qualified to serve as your counselor. However, Fordham's office for Counseling and Psychological Services provides free and confidential mental health services that are not connected to your academic record. To make an appointment, call (718) 817–3725 (RH) or (212) 636–6225 (LC).

Please be aware that as your instructor, I am required to contact and provide information to Public Safety and/or the Title IX Coordinator if I learn that you have been subject to any conduct prohibited by the University's Sexual Misconduct Policy. Once a report is made, the University will seek to properly support any affected student and make efforts to stop the prohibited behavior, prevent it from recurring, and remedy its effects. There are two places on campus not subject to this reporting requirement where you can seek confidential support: Counseling and Psychological Services and Campus Ministry. The Student CARE Brochure can provide you with on and off-campus resources for support and more information.

Intellectual Property

Course materials like exam questions and exercises are my intellectual property and should not be disseminated beyond class. Your lecture notes are your intellectual property and may be disseminated as you see fit.

Privacy

Student work and evaluation will be kept confidential, except as required by law or university policy, in the event of a grade dispute, or as permitted by express permission of the student. Digital copies of all examinations will be retained for one calendar year and then deleted. Hard copies of student work not retrieved by the end of the semester will be destroyed.

Please note that the Fordham Student Handbook states "recording and/or taking photographs of members of the University community… without their knowledge and consent is not permitted. Audio recording of private meetings for purposes of record-keeping or later reference is permitted only if all participants are fully-informed that recording is planned and consent is given by each participant."

Students are not permitted to record class meetings, unless the Office of Disability Services has an approved accommodation that requires recording. In such a case, recordings may not be distributed and must be deleted or destroyed at the conclusion of the semester.

Schedule

The schedule is organized by weekly topic.

Key: is a *class meeting*,
is a *recitation session*,
is a *scheduled break*,
is a *required reading assignment*,
is a *recommended reading assignment*,
is an *optional reading assignment*,
is an *exercise set*, and
is an *exam or exam revision*.

Week 1: Preference and Choice

CLASS MEETINGS

- January 19th, 5:30PM to 7:20PM EST: Lecture
- January 19th, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #1 due January 26th

READING

- MWG, Chapter 1
- Miller, Chapter 1
- Jehle and Reny, Chapter 2.3
- Varian, Hal R. 1989. What Use is Economic Theory? Mimeo.

The primitives of preference and utility are related to preferences "revealed" by choice. Only rational (complete and transitive) preferences can be represented by a utility function. Choices constructed from rational preferences must satisfy the weak axiom of revealed preference (if x is chosen when y is available, there cannot be another budget set containing both where y is chosen and x is not). If a choice structure satisfies the weak axiom and the budget set includes all subsets of the choice set up to three elements, then the choice structure must be rationalized by a single, unique preference relation.

Week 2: Consumer Choice

CLASS MEETINGS

- January 26th, 5:30PM to 7:20PM EST: Lecture
- January 26th, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #2 due February 2nd

READING

- MWG, Chapter 2
- Miller, Chapter 2.1 through 2.3
- Jehle and Reny, Chapter 1.5
- Battalio, R., Kagel, J., Rachlin, H., & Green, L. (1981). Commodity-Choice Behavior with Pigeons as Subjects. *Journal of Political Economy*, 89(1), 67–91.

The Walrasian budget set, which constitutes all feasible consumption bundles, is convex. Wealth effects and price effects (own-price and cross-price) can be applied to illustrate the wealth expansion path, offer curve, or demand curve. Homogeneity of degree zero implies proportional changes in prices lead to no change in demand, and the Walras' law implies total expenditure does not change in response to price changes (Cournot aggregation), but that total expenditure changes in equal proportion to changes in wealth (Engel aggregation). Under these assumptions, the weak axiom of revealed preference is satisfied if and only if the law of demand holds (compensated demand slopes downward).

Week 3: Classical Demand Theory, Part 1 of 2

CLASS MEETINGS

- February 2nd, 5:30PM to 7:20PM EST: Lecture
- February 2nd, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #3 due February 2nd

READING

- MWG, Chapter 3.A to 3.D
- Miller, Chapter 2.4 through 3.3.3
- Jehle and Reny, Chapter 1.1 through 1.4.1

Standard assumptions of the utility maximization problem include some useful restrictions on preference relations regarding desirability (monotonicity and local non-satiation), tradeoffs between commodities (convexity and strict convexity), and generalization from a single indifference relation (homotheticity and quasilinearity). A rational (complete and transitive) and continuous preference relation can be represented by a utility function or any strictly increasing transformation thereof. If a preference relation is concave or strictly concave, respectively, the utility function is quasiconcave or strictly quasiconcave; and a continuous preference relation is, respectively, homothetic or quasilinear if and only if utility function is homogenous of degree one, or if the numeraire commodity is additively separable. The standard formulation of the utility maximization problem must have a solution, the Walrasian demand correspondence, which is homogenous of degree zero, satisfies Walras' law (exhausts the consumer's budget); and further is a convex set, given quasiconcavity, and single-valued, given strict quasiconcavity. The indirect utility function—the utility function evaluated at its maxima—is homogenous of degree zero, strictly increasing in wealth and non-decreasing in prices, quasiconvex, and continuous.

Week 4: Classical Demand Theory, Part 2 of 2

CLASS MEETINGS

- February 9th, 5:30PM to 7:20PM EST: Lecture
- February 9th, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #4 due February 16th

READING

- MWG, Chapter 3.E, 3.G, and 3.H
- MWG, Chapter 3.F, 3.I, and 3.J
- Miller, Chapter 3.3.4 through 3.4.6
- Jehle and Reny, Chapters 1.4.1, 1.4.2, and 2.1 through 2.2
- Willig, R. (1976). Consumer's Surplus Without Apology. *American Economic Review*, 66(4), 589–597.

The utility maximization problem and expenditure minimization problems are "dual" to each other, and under standard assumptions they yield the same optimal commodity bundles for the same expenditure and required utility levels. Under such assumptions, the Hicksian demand correspondence satisfies the law of compensated demand (is "downward sloping"); is homogenous of degree zero in prices; provides no excess utility; and is a convex set, given quasiconcavity of utility, and single-valued, given strict quasiconcavity of utility. The expenditure function—the minimal cost of a given utility level—is homogenous of degree zero, strictly increasing in utility and non-decreasing in prices, concave in prices, and continuous. Assuming differentiability, Hicksian demand is the derivative of the expenditure function with respect to prices (Shephard's Lemma), and each of its cross-price derivatives is linked to Walrasian demand by a substitution and wealth effect (Slutsky equations). Walrasian demand is the ratio of partial derivatives of indirect utility with respect to prices and wealth (Roy's Identity). Through derivation of the Slutsky substitution matrix, it can be proven that every good has at least one substitute.

Week 5: Aggregate Demand

CLASS MEETINGS

- February 16th, 5:30PM to 7:20PM EST: Lecture
- February 16th, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #5 due February 23rd

READING

- MWG, Chapter 4
- Miller, Chapter 4.1 through 4.2

Aggregate demand depends on aggregate wealth if and only if indirect utility is of the Gorman Form (e.g., identical homothetic preferences, quasi-linear utility with the same numeraire commodity), or under certain restrictions about how wealth is aggregated. Aggregate demand satisfies continuity, homogeneity or degree zero, and Walras' law, but does not necessarily satisfy the weak axiom, even when the individual demand of consumers does satisfy the weak axiom. Rather, the weak axiom is satisfied when wealth is compensated at the individual level, but not necessarily when wealth is compensated at the aggregate level. However, the uncompensated law of demand does aggregate, meaning that aggregate demand will follow it when individual demand does, such as when individual demand is homothetic. A representative consumer is an agent that generates aggregate demand when faced with society's budget constraint.

Week 6: Choice Under Uncertainty

CLASS MEETINGS

- February 23rd, 5:30PM to 7:20PM EST: Lecture
- February 23rd, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #6 due March 2nd

READING

- MWG, Chapter 6.A through 6.D
- Miller, Chapter 6
- Jehle and Reny, Chapter 2.4
- MWG, Chapter 6.E through 6.F
- Grether, D. M., & Plott, C. R. (1979). Economic Theory of Choice and the Preference Reversal Phenomenon. *American Economic Review*, 69(4), 623–638.

Compound lotteries can be reduced to simple lotteries under the consequentialist hypothesis. The Expected Utility Theorem states that if preferences over simple lotteries are rational (complete and transitive), continuous, and satisfy the independence axiom (indifference curves are straight, parallel lines on the simplex), then they are representable by a von Neumann Morgenstern (VNM) utility function of expected utility form. VNM utility is the utility over a given amount wealth in a state, Bernoulli utility, linearly weighted by the probability of each state. Thus, VNM utility is linear in the cumulative distribution function describing a lottery, and Bernoulli utility is assumed increasing and continuous. If the Bernoulli utility function is concave, the agent is a risk averter, for whom the certainty equivalent is less than the expected value of the lottery, the probability premium is positive, and the Arrow-Pratt measure of absolute risk aversion is positive. All expected utility maximizers prefer a lottery to alternatives that are first-order stochastically dominated, and that risk-averse expected-utility maximizers also prefer a lottery to alternatives that are second-order stochastically dominated (such as a mean-preserving spread).

Week 7: Production

CLASS MEETINGS

- March 2nd, 5:30PM to 7:20PM EST: Lecture
- March 2nd, 7:30PM to 8:30PM EST: Recitation

ASSIGNMENTS

- Exercises #7 due March 23rd

READING

- MWG, Chapter 5
- Miller, Chapter 5
- Jehle and Reny, Chapter 3
- Alchian, A. A., & Demsetz, H. (1972). Production, Information Costs, and Economic Organization. *American Economic Review*, 62(5), 777–795.

Common assumptions about the production set include that it is nonempty and closed, yields no free lunch, gives possibility of inaction, has free disposal, is irreversible, exhibits (non-in/)decreasing and constant returns to scale, is additive (free entry), and/or that it is convex or/or concave. Concavity and inaction being possible implies non-increasing returns to scale, and non-increasing, additive production sets must be convex cones. Cost minimization is a necessary but not sufficient condition for profit maximization, and standard assumptions permit derivation of properties of cost and profit functions.

Week 8: Midterm Exam

CLASS MEETINGS

- March 9th, 5:30PM to 7:20PM EST: Midterm Exam

The midterm exam will cover weeks 1 through 6 (not week 7).

Week 9: Spring Recess

CLASS MEETINGS

- March 16th: No Lecture or Recitation

Week 10: General Equilibrium, Part 1 of 2

CLASS MEETINGS

- March 23rd, 5:30PM to 7:20PM EDT: Lecture
- March 23rd, 7:30PM to 8:30PM EDT: Recitation

ASSIGNMENTS

- Exercises #8 due March 30th

READING

- MWG, Chapter 15.A through 1.5C
- Jehle and Reny, Chapters 5.1 and 5.3.1
- MWG, Chapter 15.E

A pure exchange economy is one in which consumers trade endowments. In such an economy, non-wasteful allocations over two consumers can be represented within an Edgeworth box. A Walrasian equilibrium in an Edgeworth box economy, where one consumers' net demand equals the other's net supply, occurs at the intersection of non-endowment offer curves. Under the assumptions that preferences are strictly, convex, continuous, and strongly monotone in an Edgeworth box economy, a Walrasian equilibrium allocation is Pareto optimal, and any Pareto optimal allocation can be supported as a Walrasian equilibrium with transfers. Under fairly strict assumptions, a one-consumer, one-firm "Robinson Crusoe" economy has allocations that are the same as those that would arise from the optimization problem of a "benevolent social planner".

Week 11: General Equilibrium, Part 2 of 2

CLASS MEETINGS

- March 30th, 5:30PM to 7:20PM EDT: Lecture
- March 30th, 7:30PM to 8:30PM EDT: Recitation

READING

- MWG, Chapters 16.A through 16.D and 17.A through 17.F
- Jehle and Reny, Chapter Chapters 5.2.1 through 5.2.2 and 5.5
- MWG, Chapters 16.E through 16.G and 17.G through 17.I

An allocation is Pareto optimal if no other allocation Pareto dominates it. A Walrasian equilibrium in a private ownership economy—with competitive pricing, complete markets, and publicly quoted prices—satisfies profit maximization, utility maximization, and the market clearing condition. With the addition of locally non-satiated preferences, any price equilibrium with transfers is Pareto optimal (the first welfare theorem). By also assuming rational, locally non-satiated, convex, and continuous preferences where zero is in the consumption set, it can be shown that there exist initial endowments and a vector of prices that supports any Pareto optimal outcome as a price equilibrium with transfers (the second welfare theorem). By further assuming continuous, strictly convex, and strongly monotone preferences, it can be shown that a price vector supports an equilibrium if and only if it yields zero excess demand in all commodity markets. Under these assumptions, excess demand is continuous, is homogenous of degree zero, and satisfies Walras' law. By applying Kakutani's fixed point theorem it can be proven that a Walrasian equilibrium exists in any pure exchange economy satisfying these assumptions. For a regular economy—one with a nonsingular matrix of price effects—it follows further that Walrasian equilibria are locally unique and odd in number. Finally, under some special assumptions—convex cone production technology and satisfaction of the weak axiom of excess demand, or satisfaction of the gross substitution property for an endowment economy—it can be shown that general equilibrium is unique.

Week 12: Externalities and Public Goods

CLASS MEETINGS

- April 6th, 5:30PM to 7:20PM EDT: Lecture
- April 6th, 7:30PM to 8:30PM EDT: Recitation

ASSIGNMENTS

- Exercises #9 due April 13th

READING

- MWG, Chapter 11.A through 11.D
- MWG, Chapter 11.E
- Miller, Chapters 7.1 through 7.3.0 and 8
- Coase, R. (1960). The Problem of Social Cost. *The Journal of Law & Economics*, 3, 1–44.

A simple bilateral externality is an unpriced cost or benefit to one agent imposed as a cost or benefit on another. In a partial equilibrium model with quasilinear preferences, the competitive outcome is not Pareto optimal, overproducing negative externalities and underproducing positive externalities. Possible solutions, for which the requirements and range outcomes for each may be characterized, include quotas, Pigouvian taxation, enforceable property rights with bargaining, and pricing the "missing market" for the externality. In the case of multilateral externalities presented by nondepletable public goods, said goods will be underprovided in Nash equilibrium by the market relative to the Pareto optimal allocation.

Week 13: Market Power, Part 1 of 2

CLASS MEETINGS

- April 13th, 5:30PM to 7:20PM EDT: Lecture
- April 13th, 7:30PM to 8:30PM EDT: Recitation

ASSIGNMENTS

- Exercises #10 due April 20th

READING

- MWG, Chapter 12.A to 12.C
- Jehle and Reny, Chapter 4.2
- Miller, Chapter 9

A monopolist, being the sole producer of the good, will price above marginal cost, with lost gains from trade being measurable as deadweight loss. In static models of oligopoly, where markets are occupied by a "few" finite number of firms, outcomes depend upon how market demand is rationed. When the whole market is taken by the firm with the lowest price and split otherwise, as under Bertrand competition, the unique Nash equilibrium exhibits competitive pricing. When the market price adjusts to aggregate quantity per inverse demand, as under Cournot competition, the unique Nash equilibrium exhibits pricing between that of monopoly and perfect competition, with each being limiting cases. Under the "linear city" model of price differentiation, the profitability of each firm increases with the amount of product differentiation.

Week 14: Market Power, Part 2 of 2

CLASS MEETINGS

- April 20th, 5:30PM to 7:20PM EDT: Lecture
- April 20th, 7:30PM to 8:30PM EDT: Recitation

ASSIGNMENTS

- Exercises #11 due April 27th

READING

- MWG, Chapter 12.D to 12.G
- Collins, S. M., James, D., Servátka, M., & Woods, D. (2017). Price-Setting and Attainment of Equilibrium: Posted Offers versus an Administered Price. *Games and Economic Behavior*, 106, 277–293.

Analysis of an infinitely repeated market interaction concerns equilibria that might arise when a firm responds to the entire history of interactions with its competitors. Under infinitely repeated Bertrand play, a Nash reversion trigger strategy can support a subgame perfect Nash equilibrium with monopoly pricing when the present discounted value of future losses is large enough relative to the possible short-run profits earned from deviation. The (more general) folk theorem states that collusive outcomes can be supported in infinite horizon games when players discount the future to a sufficiently small degree. The size of a positive entry cost can determine a unique, equilibrium number of entrants, including supporting a monopoly (as in the case of Bertrand with entry). Under Cournot competition, as the market size grows, the price converges in the limit to minimum average cost (as in perfect competition), irrespective of the magnitude of entry costs.

Week 15: Mechanism Design

CLASS MEETINGS

- April 27th, 5:30PM to 7:20PM EDT: Lecture
- April 27th, 7:30PM to 8:30PM EDT: Recitation

READING

- MWG, Chapter 23.A to 23.C
- MWG, Chapter 23.D to 23.F
- Jehle and Reny, Chapter 9

There are constraints on circumstances under which a social choice function can be implemented in dominant strategy equilibria when agent preferences are private information; for example, in first-price and second-price sealed-bid auctions. The revelation principle tells us that we can restrict attention to direct revelation mechanisms that induce agents to truthfully reveal their preferences. For a very general class of problems, it is not possible to implement satisfactory social choice functions in dominant strategies; it is thus common to consider environments where agents have quasilinear preferences with respect to the same numeraire commodity.

Week 16: Final Exam

CLASS MEETINGS

- May 4th, 5:30PM to 7:20PM EDT: Final Exam

The final exam will cover weeks 7 and 10 through 14 (not weeks 8, 9, or 15).

Week 17: Exam Revisions Due

CLASS MEETINGS

- May 11th, 11:59PM EDT: Exam Revisions Due