Microeconomics is the study of individual economic agents such as households and firms. This course will be largely concerned with models of behaviour - that is ways of thinking about how economic agents make decisions and interact with one another. A model is a simplified formal representation of a more complex system. Good models are built to be as simple as possible while still preserving some essential set of relationships from the system they represent. One advantage of working with formal ("mathematical") models is that assumptions are kept explicit and are therefore always subject to question. At the end of this course, you should gain a healthy skepticism of both over-dependence and under-dependence on formal models in the general discourse. If you are majoring in business, economics or another social science such as political science, this course will have direct value as you go on to employ variations of these models in your respective fields.

2. Learning Objectives

The standard approach economists take to understanding human behavior is to imagine that individuals have a clear set of choices and are constantly searching for the best available choice that meets their objective - whatever that may be. At its heart, this course consists of two simple individual-agent optimization problems as well as their composition into models of market behavior. Here is the minimum of what you should know by the end of this course.

- The Consumer’s Problem. Given prices and a fixed amount of wealth or income, what is the optimal combination of goods and services to purchase? The solution to this problem is demand.
- The Firm’s Profit Maximization Problem. Given a production technology, factor prices, and an output price, how much should a firm produce to maximize profit? The solution to this problem is supply.
- Partial Market Equilibrium. How do optimizing consumers and profit-maximizing firms determine prices and the distribution of surplus in a competitive market when prices in other markets are exogenously determined.
- General Equilibrium. In an economy with more than one good, how are prices determined? This will provide framework for understanding the First and Second Welfare Theorems.
- Market Failure. Ideal perfectly competitive markets do not exist. All markets “fail” to at least some degree and for a wide variety of reasons. We will do our best to cover some of the
most important sources of market failure - Market Power (e.g. Monopoly), externalities, and asymmetric information.

3. Text Books

- **Primary.** I will assign readings mainly from Hal Varian’s *Intermediate Microeconomics*. Any edition 4th or later is fine.
- **Strongly Recommended.** *Workouts in Microeconomics* by Bergstrom and Varian.
- **Alternative Micro Texts.** Varian does not have a Monopoly on Intermediate Micro texts. There are many excellent alternatives; they all contain more or less the same concepts presented in slightly different ways or at different levels of analytical rigor. If you find a book whose style better fits your preferences, you should read it. However, you are responsible for figuring out which chapter in the alternative substitutes for a Varian reading assignment. Also quizzes on the reading will be based on Varian. Chances are that reading an alternative will serve you just fine on quizzes, but I don’t guarantee it.
  - Perloff *Microeconomics*. This text is a little less formal than Varian. If you find yourself complaining that Varian doesn’t have enough examples or is too “mathematical” you may want read Perloff.
  - Nicholson and Snyder *Microeconomic Theory: Basic Principles and Extensions*. If you have taken Calc 101, 102 and 221 and find yourself complaining that Varian is not “mathematical” enough, this book is the one for you.

4. Grading

Your grade for the course will based on the following weights.

- **Homework Assignments (10%).** You are encouraged to form study groups and work together on the homework assignments. However each student must turn in their own write-up. Homeworks will be graded for effort and completion - not necessarily accuracy. You will be responsible for checking the accuracy of your analysis against the answer keys. (See “Homework Advice and Style Guide” below.)
- **Quizzes (20%).** I will frequently give short unannounced in-class quizzes based on the day’s reading or previous lectures. Your lowest quiz score (including zeros due to absences) will be dropped from my grade tally. If you are forced to miss more than one quiz due an unavoidable university-sanctioned absence or severe illness, please let me know.
- **Participation (10%).** Participation in classroom discussion.
- **Exams (60%).** Exams will be based on the readings, lectures and homeworks. A midterm (30%) will be offered during the evening of October 21, time and place TBA. The final exam (30%) will be administered through the Williams School during exam week.

5. Homework Advice and Style Guide

Homework assignments count for a nearly trivial portion of your final grade (10%). However, mastering the material in them is the best way to prepare the exams. Here is a procedure for
completing your homework assignments in a way that prepares you for the exams and, more importantly, results in long-term retention of the economic concepts.

(1) As soon as a new homework is posted, start working on it. Make an attempt, on your own, on each problem.
(2) Get together with your study partners and try to hash out complete solutions through dialogue and reconciliation of your various attempts.
(3) Once you taken the steps just outlined, remaining sources of confusion should be addressed in office hours; either come in yourself or send a representative from your study group.
(4) If necessary, reconvene with your study group and finalize your solutions. Do not copy each others’ answers in these study group sessions; you should be teaching each other the economic theory behind your solution. If you cannot explain your answer to your group, you do not fully understand it. Meet in a room that has a chalk board. The library and Holecamp have rooms specifically dedicated to group study.
(5) Write up your own version to turn in.
(6) Once the answer key is posted, reconcile your work with it.

You should expect the total time commitment for one problem set to be 4-8 hours depending on how easily the material comes to you.

5.1. The Check-Plus Standard. FOR ALL PROBLEMS: Your work should stand alone as an (easily readable) document illustrating economic theory. As a practical matter, this will usually involve writing at least one or two complete sentences of explanation for each problem along with some well-labeled diagrams. I do not want long essays, but I do want to be convinced that you truly understand your answers.

- Every problem is answered.
- Every solution is explained.
- Every diagram is well-labeled.

When you turn in your final document, consider its quality. Ask yourself, if you were working as a consultant, is this something that you would hand over to your client? If you are not sure what I mean by “explain” or “well-labeled”, please refer to the style guide.

5.2. Solution Style Guide. When writing up a solution, your goal is to convince your reader that your answer is correct, provide them with a clear explanation of how you found it and tell them why it may be interesting. Explain. Illustrate. Interpret.

- Explain. This is where you tell the reader where your answer came from and how you found it. A big part of explaining is the "set-up". This usually involves re-stating the question and key assumptions as well as laying out your strategy for deriving the solution. Explaining also requires that you “show your work”. Non-trivial logical steps should be written out. I don’t expect equations to be re-written after every single logical operation, but at a minimum you need to show the starting point, and say a word or two about how you got from there to here. For example you might begin by saying, “By definition, the budget line equation is

\[ p_1x_1 + p_2x_2 = m \]
Subtracting $p_1 x_1$ and dividing by $p_2$, this equation may be written as

$$x_2 = \frac{m - p_1 x_1}{p_2}$$

..."

**Illustrate.** Drawing a picture or giving an example is not always necessary, but can often go along way toward clarity. The 2-axis diagram is so common it deserves a special set of style guidelines:

- **Title.** Write a brief descriptive title or caption above or below your diagram (e.g. “Judy’s Budget Reacting to the Price of Apples”). Your title (along with a caption if necessary) should briefly answer the question “What are we looking at in this diagram?” This is especially important if your answer has more than one diagram.

- **Label Axes.** What is being measured on each axis? In what units? linear or log scale? On an exam, a diagram without labeled axes runs a high risk of getting zero points unless you have made clear in some other way what space is being represented in your diagram.

- **Label Graphs.** If you have more than one graph (line, curve, demarcated area, etc.) in your diagram, you must indicate which graph is which somehow. Also, it is probably not a good idea to put more than 3 graphs in the same diagram, though this is not a hard and fast rule. You may also want to consider using different colors in addition to labels or making a key if you have multiple graphs. Finally it should go without saying, but if you have multiple graphs in the same 2-axis diagram, each graph should be capable of living in the space defined by the axes. For example, a demand curve is a set of quantity-price pairs, while a budget line is a set of quantity-quantity pairs. They obviously cannot be represented in the same space.

- **Annotate.** Interesting graph features should be labeled. Uninteresting points should NOT be labeled. This determination is a bit subjective, but in general, if it is directly relevant to your answer, label it. Discontinuities, kink points, intercepts, changes in the sign of the slope and intersections stand a good chance of being interesting - though again this is not a hard rule. Remember, your picture should clearly illustrate your point with as little clutter as possible.

- **Discuss it.** Refer to your diagram in the explanation and interpretation of your answer. Say a word or two about the special features that you labeled.

**Interpret.** This is what you say about your answer or solution after you have found it. What does it mean? Why is it interesting? Not every problem will require any or much of this, but if you’re answer does have interesting implications, be sure to point them out.
6. Schedule of Topics

The following is a tentative list of topics we will do our best to cover in lecture. Please read the corresponding chapter **before** coming to class. (Vxx = Varian Chapter xx - 8th Edition; if you have a different edition, go by the chapter titles not the numbers.)

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