COURSE SYLLABUS
FOR
INTERMEDIATE MICROECONOMICS 3020
FALL SEMESTER 2016

Course Description and Prerequisites

Economics is broadly defined as a way of thinking about problems of allocation. This course entails the use of intermediate microeconomics theory in the analysis of problems facing decision-makers, not only in business, but also in government and other nonprofit organization. Intermediate microeconomics theory can be described as the theory of choice. It has application to all decision problems. Specific theoretic tools are taught and applied to real world settings in order to learn optimal decision guidelines.

The prerequisites for this course are a beginning economics class in microeconomics and a basic understanding of algebra and geometry. Prerequisites listed in the course catalog are ECON 1010, 1020, MATH 2200 and 2350.

Required Textbook


Determining Your Grade

During the course there are two “midterm” examinations. At the end of the course there is a comprehensive final examination; in the final exam there is some emphasis on the material following the second examination. All of the exams consist of multiple choice questions. Questions will be of a problem-solving nature much like those assigned in the homework. The homework questions are excellent preparation for the examinations. Answers to many of these questions are worked into the lectures, and answers to all of the questions are available from the instructor upon request.

The midterm examinations have forty questions for 40 points; the comprehensive final has sixty questions for 60 points. Questions tend to be challenging. The total number of possible exam points is 140. Twelve weekly homework assignments are graded. If all assignments are promptly handed in and effort is made to do the problems correctly, a student earns 60 points (five points per assignment). Missed or late assignments do not count. Hence missing one assignment gives a student a score of 55, missing two assignments is a score of 50, and so on. No excuses for late or missed assignments are accepted. The grade which you receive in the
course is determined by your test and homework scores and depends on the total points earned. Grades are assigned as follows:

<table>
<thead>
<tr>
<th>Points Earned</th>
<th>Grade</th>
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<tbody>
<tr>
<td>175-200</td>
<td>A</td>
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<td>155-174</td>
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<td>Below 115</td>
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Academic Dishonesty

Also known as “cheating,” academic dishonesty will not be tolerated in this class. Cases of academic dishonesty will be prosecuted in accordance with UW Regulation 6-802. Cheating in this course can result in an “F” in the course. In this course, academic dishonesty includes (but is not limited to) unapproved assistance on examinations, copying the homework of others, plagiarism or other use of published materials without complete citations, or fabrication of referenced information.

Class Decorum

Please have your cell phone off and put away while in class. Put away material irrelevant to the class. Respect the opinions of other students during discussions. The professor may call upon you at any time for your thoughts. Be prepared.

Sequence of Lectures, Reading Assignments, and Examinations

Below is a schedule of lecture topics, reading assignments, and date that homework assignments are due. It is highly recommended that you read assignments before coming to class. If you have questions about the lecture or reading you are welcome to telephone the instructor at (307) 766-2195 or send an e-mail to owenphil@uwyo.edu.

<table>
<thead>
<tr>
<th>Date</th>
<th>Week Number</th>
<th>Lecture Topics</th>
<th>Required Reading/ Homework Assignments</th>
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<tr>
<td>August 29</td>
<td>1</td>
<td>Supply and Demand Elasticity</td>
<td>Pindyck/Rubinfeld Chapter 1 &amp; 2</td>
</tr>
<tr>
<td>September 7</td>
<td>2</td>
<td>Optimizing Without a Constraint</td>
<td>Maurice/Phillips photocopy Problem Set 1 due</td>
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<td>Optimizing With a Constraint</td>
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<td>September 12</td>
<td>3</td>
<td>Consumer Utility Indifference Curves</td>
<td>Pindyck/Rubinfeld Chapter 3</td>
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<td>Utility Maximization</td>
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<td>Demand</td>
<td>Problem Set 2 due</td>
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<td>Date</td>
<td>Week Number</td>
<td>Lecture Topics</td>
<td>Required Reading/ Homework Assignments</td>
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<tr>
<td>September 19</td>
<td>4</td>
<td>Income and Substitution Effects</td>
<td>Pindyck/Rubinfeld Chapter 4 (Including Appendix)</td>
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<td>Applying Utility Theory</td>
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<td>Review for 1st Exam</td>
<td>Problems Set 3 due</td>
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<tr>
<td>September 26</td>
<td>5</td>
<td>First Examination (75 minutes)</td>
<td>Pindyck/Rubinfeld Chapter 6</td>
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<td>Production with One Input Isoquants</td>
<td>Problems Set 4 due</td>
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<td>October 3</td>
<td>6</td>
<td>The Expansion Path</td>
<td>Pindyck/Rubinfeld Chapter 7 (Including Appendix)</td>
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<td>Returns to Scale</td>
<td>Problem Set 5 due</td>
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<td>October 10</td>
<td>7</td>
<td>Short Run Cost</td>
<td>Pindyck/Rubinfeld Chapter 8 &amp; 9</td>
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<td>Long Run Cost</td>
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<td>An Introduction to Market Structure</td>
<td>Problems Set 6 due</td>
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<td>October 17</td>
<td>8</td>
<td>Perfectly Competitive Firms</td>
<td>Pindyck/Rubinfeld Chapter 10</td>
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<td>Perfectly Competitive Markets</td>
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<td>Defining Monopoly and Market Power</td>
<td>Problems Set 7 due</td>
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<td>October 24</td>
<td>9</td>
<td>Monopoly Theory</td>
<td>Pindyck/Rubinfeld Chapter 11</td>
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<td>Monopoly Behavior</td>
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<td>October 31</td>
<td>10</td>
<td>Price Discrimination</td>
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<td>Review for 2nd Exam</td>
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<td>Second Examination (75 minutes)</td>
<td>Problem Set 8 due</td>
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<td>November 7</td>
<td>11</td>
<td>Topics on Firms with Market Power</td>
<td>Pindyck/Rubinfeld Chapter 12</td>
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<td>Monopolistic Competition/Advertising</td>
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<td>November 14</td>
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<td>Oligopoly</td>
<td>Pindyck/Rubinfeld Chapter 13</td>
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<td>Game Theory</td>
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<td>November 21</td>
<td>13</td>
<td>Labor Markets</td>
<td>Pindyck/Rubinfeld Chapter 14 &amp; 15</td>
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<td>Discounting</td>
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<td>Investment</td>
<td>Problem Set 10 due</td>
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<td>November 28</td>
<td>14</td>
<td>Pareto Optimality</td>
<td>Pindyck/Rubinfeld Chapter 16</td>
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<td>Efficient Exchange</td>
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<td>General Equilibrium</td>
<td>Problem Set 11 due</td>
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Detailed Description of Topics

Below is a description of the learning objectives for each week. You are expected to have a competent understanding of this material, such that you could apply the concepts. Home works and exams are intended to foster understanding in applied contexts. Reading assignments are made to give you a second look at intermediate microeconomic tools. The reading is important. Regular reading of the Wall Street Journal is highly recommended to sharpen your perspective. From time-to-time the professor will bring up articles from the WSJ for discussion.

Week 1:
Supply and Demand
Elasticity

This lesson is on the definition of economics and describes how the study of economics applies to making decisions. Microeconomics is the study of how households, which may consist of one individual, and organizations make decisions. The important decision rule is to continue with an activity if marginal benefit is greater than marginal cost, and stop just when marginal benefit is equal to marginal cost. Marginal benefit is the gain from one more unit of activity. Marginal cost is the expense of one more unit of activity. This decision rule is developed more thoroughly as the course progresses. Review is done on drawing graphs and writing demand and supply equations.

Demand is a list that shows the quantities individuals are willing and able to buy at all prices. Supply is a list that shows the quantities sellers are willing and able to provide at all prices. We define a change in supply or demand, and the meaning of movement along a schedule. Demand and supply schedules are combined to illustrate a market equilibrium. An equilibrium exists at the intersection of these two schedules. Prices and quantity sold change as demand and supply change. For instance, an increase in demand will usually increase price and the quantity sold.

Elasticity of demand is introduced as a measure of how sensitive consumers are to a change in price. If price fall and the quantity demanded changes very little, demand is insensitive or inelastic. If, on the other hand, the quantity demanded changes greatly, demand is sensitive or elastic. The point elasticity formula is defined and applied toward finding elasticity along a demand schedule.
Week 2:
Optimizing Without a Constraint
Optimizing With a Constraint

Topics on elasticity as completed if necessary. Work is begun on optimizing without a constraint. The optimizing rule is to continue an activity until marginal cost (MC) of the endeavor is equal to marginal benefit (MB). If MB > MC proceed with the operation; if MC > MB cut back on the pursuit.

Most decision making, however, does restrict the amount of resources that can be used in an endeavor. Decisions are made under a constraint. The constrained optimization rule is discussed in detail through two examples. One involves a marketing question that deals with optimal advertising expenditure. The other is about the proper amount of food to feed chickens if weight is to be maximized.

Week 3:
Consumer Utility
Indifference Curves
Utility Maximization
Demand

The definition of utility and the concept of a utility function are introduced. Utility measures happiness and it is generally assumed that more of any good yields greater utility. Marginal utility is also defined. Indifference curves are derived from a utility function with two goods, X and Y.

Indifference curves are discussed in detail. Their slope is defined as the marginal rate of substitution. Indifference curves: (1) do not cross, (2) have a downward slope, and (3) are convex. It is shown that maximizing utility subject to a budget constraint follows the constrained optimization rule set out in lecture 2. Maximization entails setting \( \frac{MU_x}{P_x} = \frac{MU_y}{P_y} \). Budget lines are introduced graphically.

Utility maximization is described. It is reached where the budget line is tangent to the indifference curve. Where the slopes are equal (i.e. tangency) \( \frac{MU_x}{MU_y} = \frac{P_x}{P_y} \); the first term is the slope of the indifference curve, the second term is the slope of the budget line. This expression can be rewritten as \( \frac{MU_x}{P_x} = \frac{MU_y}{P_y} \). The consumer optimizes by equating the marginal benefit per dollar across goods. The income consumption line, its related Engel curve, the price consumption line, and derived demand are discussed in this lecture.
Week 4:
Income and Substitution Effects
Applying Utility Theory
Review

Optimization principles are reviewed. The income and substitution effects in utility maximization theory are presented. For a price change, the income effect is the change in quantity consumed due to a change in purchasing power. The substitution effect is the change in quantity attributable to the new relative price of the good. Several scenarios are described for prices increases and decreases. Also the good may be normal or inferior. For normal goods the income and substitution effects move quantity in the same direction. For inferior goods the income and substitution effects move in opposite directions. Ordinary and compensated demand curves are related to the income and substitution effects.

Three public policy applications are made that use indifference curves and budget lines. The first compares the effect of a sales tax and an income tax. Income taxes are less burdensome. The second looks at the effects of inflation and diagrams what a price index measures. The third discusses the incentives created by a food stamp program.

Discussion centers on important topics through Chapter 4 of the text and the photocopied reading. These would include market equilibrium, shifts in demand and supply, elasticity, unconstrained optimization, constrained optimization, utility maximization, and the income and substitution effect. Practice problems are worked to prepare for the exam.

Week 5:
First Examination (Sample Provided)
Production with One Input
Isoquants

The first examination covers 75 minutes.

The theory of production is introduced. The production function acts upon inputs to generate outputs. This function is determined by technology. An example or production in one variable is introduced to define and illustrate marginal product and average product in production.

The related definitions of marginal revenue product (MRP) and average revenue product (ARP) are presented in a discussion of the stages of production. A profit maximization enterprise will operate in Stage II. The production function in two variables is introduced. Isoquants are defined. The slope of an isoquant is the marginal rate of technical substitution (MRTS). This slope is equal to the ratio of marginal products for a production function with two units.
Week 6:
The Expansion Path
Returns to Scale

The concept of an isoquant is reviewed. Isocost lines are introduced and combined graphically with the isoquant to show production efficiency. Efficiency occurs where the isocost line and isoquant are tangent. This means $MP_K/P_K = MP_L/P_L$, where $MP_i$, $i = K, L$ is the marginal product of the $i$th input and $P_i$ is the price of the input. Usually $K$ refers to a generalized capital input and $L$ to a generic labor input. The expansion path is the set of all efficient points at different cost levels.

The production function is used to generate a definition of returns to scale. A specific example is used from the Cobb Douglas production function. The Cobb Douglas form is also used to solve for the efficient output at the tangency of an isocost line and isoquant. Finally, points along the expansion path are used to derive long run total cost (LRTC). From LRTC schedule, long run average cost (LRAC) and long run marginal cost (LRMC) are defined.

Week 7:
Short Run Cost
Long Run Cost
An Introduction to Market Structure

The short run total cost function is derived from the expansion path when one input is fixed. In the short run costs are either fixed or variable. Short run total cost is the sum of fixed costs and variable costs. Average costs and marginal costs are derived from the total cost function. It is important to remember that in economics all opportunity costs are counted, not just those that have an explicit price tag. Several problems are worked. This is a good review of production theory. Topics related to long run total cost are developed. Economics of scale are defined.

The relation between short run average cost (SRAC) and long run average cost (LRAC) is discussed. The LRAC curve is comprised of the lowest sections of the SRAC curves. Each SRAC curve, and there can be many, represents a different scale of operation. Minimum cost is achieved by operating on the LRAC schedule. The second part of the lecture introduces the competitive market structure. In perfect competition there are many firms producing identical products. No single firm has the capability to influence price.
Week 8:
Perfectly Competitive Firms
Perfectly Competitive Markets
Defining Monopoly and Market Power

Profit maximization for a perfectly competitive firm is discussed. Above normal, normal, and below normal profitability are illustrated. Entry and exit take place to restore normal profits in competitive markets. The shutdown point is defined. In the short run firms will continue to operate as long as price is greater than average variable cost. Long run equilibrium for a perfect competition is described. Three types of competitive industries are discussed: increasing cost, constant cost, and decreasing cost industries.

We begin the study of monopoly. A monopolist sells a product for which there are no good substitutes. Goods and services that are easily substituted by consumers are in the same market. Products may not be in the same market in differences make them poor substitutes or there is geographic separation between the seller’s goods. Marginal revenue for a monopolist is defined. A marginal revenue schedule lies below demand.

Week 9:
Monopoly Theory
Monopoly Behavior

Profit maximization for monopoly is discussed. Monopoly exists, and above normal profits can be present, because there are barriers to entry. Several potential barriers are listed. Public policy against monopoly exists because relative to competitive markets, outputs are restricted and prices are raised.

The concepts of producer’s and consumer’s surplus are developed to evaluate monopoly. Consumer’s surplus measures the net benefit to a buyer of participating in a market; producer’s surplus measures net benefit (closely akin to profit) to the seller. A market is efficient if total surplus, the sum of consumer’s and producer’s surplus, is maximized.

Week 10:
Price Discrimination
Review for Second Examination
Second Examination

The deadweight welfare loss caused by monopoly is demonstrated using consumer’s and producer’s surplus. This loss is a primary reason for public policy against monopoly, but monopoly may be the only market structure that can successfully produce the product if costs are
high. Price discrimination is a means by which monopoly can increase profits. Several methods of price discrimination are discussed in this lecture.

This lecture reviews the material developed since the first exam. The text chapters and the corresponding lectures are tested in the second examination. Questions and problems from an old exam are used to review important topics.

The second examination is scheduled for 75 minutes.

Week 11:
Oligopoly
Game Theory

Oligopoly theory begins with a definition of rivalry. Rivalry is recognized dependency in the market. It is fostered by a small number of firms. Equilibrium in oligopoly is explained with game theory. Game theory is the study of conflict resolution. The prisoner’s dilemma is discussed as a simple game.

Basic principles in game theory are introduced in this lecture. Games can have dominant solutions. When agents reach an outcome for which no one has an incentive to change, the outcome is a Nash equilibrium. Games may have multiple Nash equilibria. For two firms in a market with linear demand a game is presented. Firms make output choices, and it is quickly demonstrated that Nash equilibrium is reached. There are more cooperative outcomes than Nash.

Week 13:
Labor Markets
Discounting
Investment

Most of the lecture is devoted to discussing topics on labor markets. Perfectly competitive labor markets are modeled using supply and demand like any commodity. Minimum wages are price floors that restrict employment. Unions can monopolize a labor market. Labor time is restricted in order to increase the price of labor time. Monopsony in labor markets is discussed. Monopsony means one buyer. One buyer of labor time has a marginal factor cost curve that lies above the supply curve.

The monopsony labor market equilibrium is described. The amount of labor employed is decided by the intersection of marginal factor cost and marginal revenue product. Bilateral monopoly exists when a monopsony faces union (monopoly). Labor payments have a lower and
upper bound, but are not precisely determined. The investment decision is discussed in detail. Investment projects are ranking by their internal rate of return (IRR) from highest to lowest. Firms continue to invest in those projects that have an IRR greater than or equal to the interest rate. Perfectly anticipated inflation does not affect investment if rates of inflation are low. Higher interest reduces investment. The concept of present and future value also determines how long a decision maker should hold a sterile asset.

Week 14:
Pareto Optimality
Efficient Exchange
General Equilibrium

The definition of Pareto optimality is presented. Optimality occurs when a change cannot be made without hurting a party to the action. For example, any income distribution between individuals is Pareto optimal in the sense it would hurt one individual to give up income that benefits another. Pareto superior moves are changes that move consumers or producers to Pareto optimality. Optimality is described for two individual traders and two producers. Finally, an Edgeworth Box is constructed to capture all Pareto optimal outcomes.

Pareto efficient exchange requires: (1) the marginal rates of substitution be equal between consumers, (2) the marginal rates of technical substitution be equal between producers, and (3) the marginal rate of transformation be equal to the marginal rates of substitution for consumers. This third condition is given more discussion in the next lecture. This lecture focuses on the derivation of the production possibility frontier (PPF) from the contract curve for producers. The slope of the PPF is the marginal rate of transformation.

The concept of General Equilibrium (GE) is introduced. There is GE in an economy if the three Pareto efficiency conditions are satisfied. Agents in an economy have no further incentive to make trades and the distribution of goods and services is efficient. A freely operating, perfectly competitive economy achieves a general equilibrium.

Week 15:
Externalities and Public Goods
Information
Review for Final Exam

Externalities are transactions outside a market. There are external benefits and external costs. External benefits are desired by the consumer; external costs are undesirable. Externalities are incorporated into a social marginal benefit (SMB) and social marginal cost (SMC) equation:
SMB = PMB + external benefit
SMC = PMC + external cost,

where PMB is private marginal benefit and PMC is private marginal cost. Optimal market outcomes are achieved by subsidizing markets where there are external benefits and taxing markets with external costs.

Public goods are defined to exist when there is nonexclusion in production or consumption. Public goods are not provided by private enterprise because of free-riding. One definition of public goods is that the marginal cost of another person consuming the good or service is zero. Optimal provision therefore requires a zero price. In addition to the free riding problem discussed in the last lecture, private enterprise cannot optimally provide a public good and cover costs.

Most of the time in this lecture is spent discussing the economics of information. Information is costly; its absence can cause markets to disappear. Less than complete information causes a risky environment. When there is a risk economic theory assumes consumers maximize expected utility and producers maximize expected profit.

Time is spent in this lecture reviewing the course material. An overview of intermediate microeconomics is given. A common thread is comparing marginal benefit with marginal cost in order to optimize. There are many different contexts in which this decision rule arises. And, as we have discussed, correctly identifying marginal benefit and/or marginal cost is crucial. A related decision rule involves a constraint. Constrained optimization entail equating marginal gains per dollar across the possible activities.