2. Supply and Demand
   • Demand: Curves, Functions, Schedules
   • Law of Demand
   • Factors influencing Demand
   • Supply: Curves, Functions, Schedules
   • Law of Supply
   • Factors influencing Supply
   • Market Equilibrium
   • What Happens when Supply and Demand Don’t Intersect
   • Effects of Shifts of Supply and/or Demand
   • Elasticity: %-change in Quantity/%-change in Price
   • Elasticity: Alternative to (inverse) Slope
   • Elasticity with Linear Demand
   • Perfectly Elastic (horizontal) and Perfectly Inelastic (vertical) Supply and Demand
   • Relation between Elasticity of Demand and Total Spending (revenue)
   • Elasticities of Demand: Price, Cross-price, Income
   • Elasticity of Supply

3. Using Supply and Demand to Analyze Markets
   • Consumer’s Surplus
   • Demand Curve as Marginal Value to Consumer (aka Marginal Willingness to Pay)
   • Producer’s Surplus (note: in short run PS = Profit + FC)
   • Price Ceilings and Floors
   • Excise Taxes: Excess Burden, Incidence & Elasticity
     $$t_D = t \times \frac{|\varepsilon_S|}{|\varepsilon_S| + |\varepsilon_D|}, \quad t_S = t \times \frac{|\varepsilon_D|}{|\varepsilon_S| + |\varepsilon_D|}$$

4. Consumer Behavior
   • Preferences: Completeness, Transitivity, Monotonicity (More is Better)
   • Indifference Map and Utility
   • Subjective Trade-offs: Marginal Rate of Substitution
   • Substitutes, Complements and the Shape of Indifference Curves
   • Constraints: The Budget Line
   • Objective Trade-offs: Slope of Budget Line ($-P_y/P_x$)
   • Consumer’s Optimum I: $\text{MRS} = P_y/P_x$ or $\text{MU}_x/P_x = \text{MU}_y/P_y$
   • Consumer’s Optimum II: Corner Solutions
5. Individual and Market Demand
   - Normal and Inferior Goods
   - Income Expansion Path and Engel Curve
   - Demand curve
   - Behind the Demand Curve: Income and Substitution Effects
   - Inferior Goods and Giffen Goods
   - Income and Substitution Effects: Labor Supply
   - Income and Substitution Effects: Borrowing and Saving

6. Producer Behavior
   - Production Function
   - Short-run (at least one fixed input) and Long-run (no fixed inputs)
   - Production with a single variable factor
     - Total, Average, and Marginal Products
     - Relation between Marginal and Average
     - Law of Diminishing Returns
   - Production with two variable inputs (e.g., long-run)
     - Isoquants
     - Marginal Rate of Technical Substitution: \( \text{MRTS}_{LK} = \frac{MP_L}{MP_K} \) (slope of isoquant)
     - Shape of isoquants and substitution (more sharply curved = more complementary)
     - Constant, Diminishing and Increasing Returns to Scale

7. Costs
   - Opportunity Cost
   - Sunk Costs
   - Costs in Short-run: FC (from fixed factor K), VC (from variable factor L)
   - Shape of SR Cost Curves: ATC, AVC, MC
   - Long-run Cost Minimizing Inputs
     - Minimum requires \( \text{MRTS}_{LK} = \frac{w}{r} \). Equivalently, \( \frac{MP_K}{r} = \frac{MP_L}{w} \).
   - Deriving the Cost Function
   - Relation of SR and LR Cost Curves
     - In short run, \( MC = \frac{w}{MP_L} \). In long run, \( MC = \frac{w}{MP_L} = \frac{r}{MP_K} \)
   - Economies of Scale
8. Supply in a Competitive Market
   • Perfectly Competitive Markets
   • Demand as seen by a Price-taker, Price-taking implies \( p = MR \)
   • Profit Maximization: \( MR = MC \) becomes \( p = MC \)
   • Short-run Shutdown condition (\( p < AVC \))
   • Supply is MC curve (above AVC)
   • Profitability (compare \( p \) and ATC)
   • Entry and Exit imply Zero Long-run Economic Profit
   • In Long-run Equilibrium: \( p = MC = ATC \)
   • Long-run Supply: Increasing and Constant Cost Industries
   • Analysis of Economic Changes (Demand, Costs) in Short and Long Runs
     ○ Demand Shifts
     ○ Taxes

9. Market Power and Monopoly
   • Monopoly: One seller, no entry, no close substitutes
   • Sources of Monopoly
   • Marginal Revenue: \( MR = p \times (1 + 1/\varepsilon_D) < p \)
   • Marginal Revenue with Linear Demand: Same vertical intercept, twice the slope. I.e., if \( p = a - bq \), \( MR = a - 2bq \)
   • Profit Maximization: \( MR = MC \)
   • Profit Maximization with Markup Pricing: \( p = \frac{\varepsilon_D}{1+\varepsilon_D} \times MC \)
   • Response of Monopoly to Shifts in Demand
   • Response of Monopoly to Cost Changes
   • Deadweight Loss due to Monopoly
   • Regulation: Effect of Price Ceilings

10. Market Power and Pricing Strategies
    • Preventing Resale
    • Perfect Price Discrimination (First Degree)
    • Price Discrimination: Segmented Markets (Third Degree): \( p_i/p_j = (1 + 1/\varepsilon_j)/(1 + 1/\varepsilon_i) \) where \( \varepsilon \) is the signed elasticity of demand
    • Indirect Price Discrimination (Second Degree): Quantity Discounts, Versioning, and Coupons
    • Price Discrimination: Bundling
    • Advanced Pricing Strategies: Two-part Tariffs
11. Imperfect Competition
   • (Nash) Equilibrium in Oligopoly
     ◦ Best Responses
     ◦ Equilibrium as Mutual Best Responses
     ◦ Dominant Strategies
   • Oligopoly: Few sellers of identical or differentiated products. Esp. duopoly = 2 sellers.
   • Cartels
   • When are Cartels unstable? (covered in game theory chapter)
   • Cournot Competition
     ◦ Cournot Competition with two firms
     ◦ Cournot Competition with many firms
     ◦ Cournot Competition with entry (Fixed cost controls entry)
   • Stackelberg Competition
   • Betrand Competition with Identical Goods \((P = MC)\)
   • Betrand Competition with Differentiated Goods (Reaction Functions)

12. Game Theory
   • What is a Game?
     ◦ Pure and Mixed Strategies
     ◦ Expected Payoffs
     ◦ Nash Equilibrium
     ◦ Dominant Strategies
   • Games with Multiple Nash Equilibria
     ◦ Coordination Game
     ◦ Escape! (full information)
   • Games that require Mixed Strategies for solution
     ◦ Rock, Paper, Scissors
     ◦ Escape! (partial information)
   • Extensive Form Games
     ◦ Imperfect Information
     ◦ Perfect Information
     ◦ Solution by Backwards Induction
   • Repeated Games
   • Grim Trigger and Tit-for-tat: Probabilities and Discounting
   • Sequential Games
   • Commitment and Credibility
   • Entry Deterance