2. Supply and Demand
   - Demand: Curve, Function, Schedule
   - Law of Demand
   - Adding Demand Curves
   - Supply, Law of Supply, Adding Supply Curves
   - Market Equilibrium
   - Shifts in Supply, Shifts in Demand
   - Joint Shifts in Supply and Demand
   - Price Controls

3. Applying the Supply and Demand Model
   - Elasticity: %-change in quantity/%-change in price
   - Elasticity: Alternative to (inverse) Slope
   - Elastic, Inelastic and total spending (revenue)
   - Perfectly Elastic (horizontal) and Perfectly Inelastic (vertical) Supply and Demand
   - Elasticities of Demand: Price, Cross-price, Income
   - Elasticity of Supply
   - Tax Incidence and Elasticity

4. Consumer Choice
   - Baskets of Goods
   - Preferences: Complete, Transitive, 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: \(MRS = P_y/P_x\) or \(MU_x/P_x = MU_y/P_y\)
   - Consumer’s Optimum II: Corner Solutions

5. Applying Consumer Theory
   - Price-consumption Path
   - Demand curve
   - Behind the Demand Curve: Income and Substitution Effects
   - Inferior Goods and Giffen Goods
   - Labor Supply
   - Borrowing and Saving
6. Firms and Production
   - 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: \( MRTS_{LK} = MP_L / MP_K \) (slope of isoquant)
     - Shape of isoquants and substitution (more sharply curved = more complementary)
     - Constant, Diminishing and Increasing Returns to Scale

7. Costs
   - 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 \( MRTS_{LK} = w/r \). Equivalently, \( MP_K / r = MP_L / w \).
   - Deriving the Cost Function
   - Relation of SR and LR Cost Curves
   - In short run, \( MC = w / MP_L \). In long run, \( MC = w / MP_L = r / MP_K \)

8. Competitive Firms and Markets
   - Costs as Opportunity Costs: Explicit and Implicit Costs
   - Perfectly Competitive Markets
   - 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
   - Increasing and Constant Cost Industries
   - Analysis of Economic Changes (Demand, Costs) in Short and Long Runs
     - Demand Shifts
     - Changes in Factor Prices
     - Productivity Changes
     - Taxes
9. Applying the Competitive Model
   • Demand Curve as Marginal Value to Consumer (aka Marginal Willingness to Pay)
   • Consumer’s Surplus
   • Producer Surplus (note: in short run PS = Profit + FC)
   • Price Ceilings and Floors
   • Price Supports
   • Tariffs and Quotas
   • Excise Taxes: Excess Burden, Incidence & Elasticity

\[ t_D = t \times \frac{|\varepsilon_S|}{|\varepsilon_S| + |\varepsilon_D|}, \quad t_S = t \times \frac{|\varepsilon_D|}{|\varepsilon_S| + |\varepsilon_D|} \]

10. General Equilibrium and Economic Welfare
   • The Edgeworth Box: Preferences and Endowments
   • Mutually Beneficial Trades and Optimal Trades
   • Budgets and the Edgeworth Box
   • Pareto Optimality: No one can be made better off without someone being made worse off.
   • Consumption Efficiency (Contract Curve): For each pair of goods, the \( MRS \) is the same for all consumers.
   • Production Efficiency: For each pair of inputs, the \( MRTS \) is the same for all firms.
   • Product-Mix Efficiency: For each pair of goods, the \( MRT \) for any firm is the same as the \( MRS \) for any consumer.
   • Competitive Equilibrium is Pareto Optimal.

11. Monopoly
   • Monopoly: One seller, no entry, no close substitutes
   • 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: \( MR = MC \)
   • Deadweight Loss due to Monopoly
   • Possibility of Long-run Profits
   • Deadweight Loss due to Monopoly
   • Regulation: Effect of Price Ceilings

12. Pricing and Advertising
   • Preventing Resale
   • Perfect Price Discrimination
   • Price Discrimination: Quantity Discounts
   • Price Discrimination: Multimarket Pricing (Segmented Markets) \( p_i/p_j = (1 + 1/\varepsilon_j)/(1 + 1/\varepsilon_i) \)
     where \( \varepsilon \) is the signed elasticity of demand
   • Price Discrimination: Two-part Pricing
   • Price Discrimination: Bundling
13. Oligopoly and Monopolistic Competition
   - Oligopoly: Few sellers of identical or differentiated products. Esp. duopoly, 2 sellers.
   - Cartels
   - Cournot Competition
   - Stackelberg Competition
   - Betrand Competition
   - Monopolistic Competition