ECON 205 Midterm 1 - Master Study Tool

Course: USC ECON 205 (Spring 2026)
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Built from: Syllabus + Lectures 01-07 (+ class exercise style)

0) Midterm 1 Scope Snapshot

Based on the posted course outline, Midterm 1 comes after Lectures 01-07 and before Lecture 08 (Money and Inflation).

Core scope: 1. Supply and Demand model 2. Applications: price ceilings/floors, elasticities, revenue 3. Macroeconomic concepts (GDP, growth, fluctuations, unemployment, inflation, interest rates) 4. National accounts (spending, income, value-added approaches) 5. Nominal vs real GDP, growth rates, GDP deflator, inflation measurement 6. Spending shares, saving, investment, interest-rate channels 7. Labor market definitions and measurement 8. Production, productivity, growth, marginal returns, returns to scale, technology

Likely lower priority for Midterm 1: - Detailed monetary/fiscal policy tools from later lectures - Open-economy policy units scheduled after midterm

1) Lecture-by-Lecture High-Yield Map

L01 - Supply and Demand

Must know: - Law of demand: price up -> quantity demanded down - Law of supply: price up -> quantity supplied up - Shift vs movement along curve - Equilibrium, shortage, surplus, self-correction

Demand shifters: - Preferences - Information - Income - Number of consumers - Prices of substitutes/complements

Supply shifters: - Technology - Input prices - Number of firms - Expected future price - Taxes/subsidies/regulation

Exam trap: - Price change alone does not shift demand/supply; it moves along a curve.

L02 - Applications + Elasticity

Price controls: - Binding price ceiling (below equilibrium): shortage - Binding price floor (above equilibrium): surplus - Non-binding controls: no market effect

Midpoint elasticity template: - $\varepsilon = \dfrac{\frac{X_2 - X_1}{(X_2 + X_1)/2}}{\frac{Y_2 - Y_1}{(Y_2 + Y_1)/2}}$

Core elasticities: - Own-price elasticity of demand: usually negative - Own-price elasticity of supply: usually positive - Income elasticity of demand: normal (>0), inferior (<0)

Revenue relation: - Elastic demand: price up -> revenue down - Inelastic demand: price up -> revenue up - Unit elastic: revenue roughly unchanged

L03 - Macroeconomic Concepts

Definitions: - Real GDP: inflation-adjusted output - Business cycle: peak, recession, trough, recovery/expansion - Unemployment rate: unemployed / labor force - Inflation: sustained rise in price level - Real interest rate: nominal interest - expected inflation

Big conceptual split: - Short run fluctuations: aggregate demand side - Long run growth: production capacity (A, K, L)

L04 - National Accounts

Three equivalent GDP approaches: 1. Spending: $Y = C + I + G + NX$ 2. Income: wages + profits + depreciation + taxes +/- adjustments 3. Value-added: sum of value added across production stages

Final vs intermediate goods: - GDP counts final output to avoid double-counting.

Investment subcomponents: - Business fixed - Inventory - Residential

Net exports: - $NX = X - M$ - $NX > 0$ surplus, $NX < 0$ deficit

L05 - Spending Shares, Saving, Investment

Shares: - Consumption share: $\frac{C}{Y}$ - Investment share: $\frac{I}{Y}$ - Government share: $\frac{G}{Y}$ - Net export share: $\frac{NX}{Y}$

Interest-rate channels: - Higher r -> lower current C, lower I, higher saving - Higher domestic r -> currency appreciation -> NX tends to fall

Saving identities: - Private saving: $S_p = Y - C - T$ - Public saving: $S_g = T - G$ - National saving: $S = S_p + S_g = Y - C - G$ - Open economy: $S = I + NX$

L06 - Labor Market

Status categories: - Employed - Unemployed (not working, actively searching) - Not in labor force

Formulas: - Labor force: $LF = E + U$ - Unemployment rate: $u = \frac{U}{LF}$ - Labor force participation rate: $LFPR = \frac{LF}{\text{adult population}}$ - Employment-population ratio: $EPOP = \frac{E}{\text{adult population}}$

Types of unemployment: - Frictional - Structural - Cyclical - Seasonal

Natural rate: - Mostly frictional + structural

L07 - Production, Productivity, Growth

Production function: - $Y = F(A, K, L)$

Productivity: - Labor productivity: $\frac{Y}{L}$ - Capital productivity: $\frac{Y}{K}$

Marginal returns to one input: - Diminishing / constant / increasing

Returns to scale (all inputs move proportionally): - Diminishing / constant / increasing

Role of technology (A): - Long-run growth engine - Policy links: R&D support, innovation incentives, human capital

2) Formula Sheet (Memorize + Use Fast)

1. $Y = C + I + G + NX$
2. $NX = X - M$
3. Nominal GDP growth: $\frac{\text{Nom}_t - \text{Nom}_{t-1}}{\text{Nom}_{t-1}}$
4. Real GDP growth: $\frac{\text{Real}_t - \text{Real}_{t-1}}{\text{Real}_{t-1}}$
5. GDP deflator: $\frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$
6. Deflator inflation: $\frac{\text{Def}_t - \text{Def}_{t-1}}{\text{Def}_{t-1}}$
7. Real interest rate: $r \approx i - \pi^e$
8. $\text{LF} = E + U$
9. $u = \frac{U}{\text{LF}}$
10. $\text{LFPR} = \frac{\text{LF}}{\text{adults}}$
11. $\text{EPOP} = \frac{E}{\text{adults}}$
12. $S_p = Y - C - T$
13. $S_g = T - G$
14. $S = S_p + S_g = Y - C - G$
15. $S = I + NX$
16. Midpoint demand elasticity: $\varepsilon_D = \frac{\frac{Q_2 - Q_1}{(Q_2 + Q_1)/2}}{\frac{P_2 - P_1}{(P_2 + P_1)/2}}$
17. Annualized growth over n years: $g = \left(\frac{X_t}{X_0}\right)^{\frac{1}{n}} - 1$

3) Graphing Toolkit (How to Score Full Points)

When asked to graph: 1. Label axes first (P vertical, Q horizontal). 2. Draw initial `D0`, `S0`, equilibrium (`P0, Q0`). 3. Shift only relevant curve(s): left = decrease, right = increase. 4. Mark new equilibrium (`P1, Q1`). 5. Add one sentence: shock -> shift -> outcome.

Price control graphs: - Ceiling: horizontal line below equilibrium, show shortage $Q_D - Q_S$ - Floor: horizontal line above equilibrium, show surplus $Q_S - Q_D$

Two-shock graphs: - Analyze one shift at a time, then combine. - Often price is clear and quantity is ambiguous (or vice versa) depending on shifts.

4) Top 25 Mistakes to Avoid

1. Confusing demand shift with quantity demanded change
2. Counting used goods in GDP
3. Counting financial asset purchases as GDP production
4. Forgetting residential construction is investment
5. Mixing nominal and real growth formulas
6. Forgetting deflator base-year value is 100
7. Using wrong denominator for unemployment rate (must be labor force)
8. Calling discouraged workers unemployed (they are out of labor force)
9. Getting sign wrong on income elasticity for inferior goods
10. Ignoring absolute value when classifying demand elasticity
11. Reversing revenue-elasticity relationship
12. Treating transfers as government purchases in GDP
13. Ignoring NX sign when interpreting trade balance
14. Forgetting $S = I + NX$ in open economy
15. Arithmetic mistakes in midpoint formula
16. Forgetting units (millions/billions)
17. Not labeling old vs new equilibrium in graphs
18. Missing ceteris paribus in explanations
19. Confusing marginal returns with returns to scale
20. Claiming one-input increase proves returns to scale
21. Forgetting technology can shift production upward
22. Confusing real and nominal wage
23. Treating cyclical unemployment as natural unemployment
24. Writing policy answers with no transmission channel
25. Leaving final answers unlabeled

5) Worked Examples (Exam-Style)

Example 1: Binding Rent Ceiling

Given equilibrium rent $P^* = 2000$, ceiling $P_c = 1600$, and at ceiling $Q_D = 62$, $Q_S = 42$ (thousand): - Binding? Yes ($1600 < 2000$) - Shortage: $62 - 42 = 20$ thousand - Likely outcomes: waiting lists, quality decline, side payments

Example 2: Price Elasticity (Midpoint)

Price rises $10 \to 14$, quantity demanded falls $120 \to 80$: - $\%\Delta Q = \frac{80-120}{100} = -0.4$ - $\%\Delta P = \frac{14-10}{12} = 0.3333$ - $\varepsilon_D = \frac{-0.4}{0.3333} = -1.20$ (elastic)

Example 3: Revenue + Elasticity

If demand is elastic and price rises, revenue falls because quantity drops proportionally more.

Example 4: GDP Spending Approach

Given $C = 17362.5$, $I = 4625.1$, $G = 4446.3$, $NX = -972.6$: - $Y = 17362.5 + 4625.1 + 4446.3 - 972.6 = 25461.3$

Example 5: Deflator Inflation

If deflator is 150 in 2019 and 146.15 in 2020: - Inflation $= \frac{146.15 - 150}{150} = -2.57\%$ (deflation)

Example 6: Labor Market Metrics

Adults=40, employed=30, unemployed=5: - LF $= 35$ - $u = \frac{5}{35} = 14.29\%$ - LFPR $= \frac{35}{40} = 87.5\%$ - EPOP $= \frac{30}{40} = 75\%$

Example 7: Saving Identity

Given $Y = 5000$, $C = 3200$, $G = 1000$, $T = 950$, $I = 900$, $NX = -100$: - $S_p = 5000 - 3200 - 950 = 850$ - $S_g = 950 - 1000 = -50$ - $S = 800$ - $I + NX = 900 - 100 = 800$ (identity holds)

Example 8: Production Function

If $Y = AK^{0.5}L^{0.5}$, with A, L fixed and K doubles: - Y multiplies by $\sqrt{2} \rightarrow$ diminishing marginal return to K.

If both K and L double: - Y doubles $\rightarrow$ constant returns to scale.

6) Active Recall Prompts (No Notes)

1. Define equilibrium price and quantity.
2. Difference between exogenous and endogenous shocks?
3. Five demand shifters?
4. Five supply shifters?
5. Why does a binding ceiling create shortage?
6. Difference between floor and ceiling?
7. Why use midpoint formula?
8. Revenue effect under elastic demand?
9. Revenue effect under inelastic demand?
10. Define real GDP in one line.
11. Three GDP approaches?
12. Why exclude intermediate goods?
13. What is investment in GDP?
14. Deficit vs surplus?
15. Deflator vs CPI?
16. Formula for real interest rate?
17. Natural unemployment rate definition?
18. Four unemployment types?

19. LFPR formula?
20. EPOP formula?
21. Cyclical vs structural unemployment?
22. All saving formulas?
23. Why does higher r reduce C and I?
24. How can higher domestic r reduce NX?
25. Marginal returns vs returns to scale?

7) 8-Day Sprint Plan (Feb 16 -> Feb 23)

Use this if exam date is Monday, Feb 23, 2026.

Day 1 (Mon Feb 16) - L01 + L02 concepts - 20 elasticity/price-control drills

Day 2 (Tue Feb 17) - L03 macro concepts - 15 concept checks

Day 3 (Wed Feb 18) - L04 national accounts - 2 full GDP calculation blocks

Day 4 (Thu Feb 19) - L05 spending shares + saving identities - 20 mixed numeric questions

Day 5 (Fri Feb 20) - L06 labor market metrics - 20 timed formula drills

Day 6 (Sat Feb 21) - L07 production/productivity/growth - 15 production-function drills

Day 7 (Sun Feb 22) - Full mixed mock (75 min) - Review only mistakes

Day 8 (Mon Feb 23 pre-exam) - Formula sheet + graph checklist - No new topics

8) 30-Minute Pre-Exam Checklist

1. Can you compute midpoint elasticity quickly?
2. Can you explain revenue-elasticity link without notes?
3. Can you do spending-approach GDP in under 2 minutes?
4. Can you convert nominal to real with a base year correctly?
5. Can you compute deflator and inflation correctly?
6. Can you compute LF, u-rate, LFPR, EPOP fast?
7. Can you do saving decomposition and identity check?
8. Can you classify unemployment type from a scenario?
9. Can you distinguish marginal returns vs returns to scale?
10. Can you draw and label a clean market graph in under 90 seconds?

If yes on all 10, you are ready.