

UCLA-ALIGNED COURSE FIELD NOTES

ECON 101

Advanced Microeconomic Theory

Factor pricing, distribution, general equilibrium, welfare, games, capital, and information

How these notes are written. I wrote each chapter the way I wish the material had been explained the first time: the real idea, the point where I usually get stuck, the simplest mental model that still stays honest, and a worked decision instead of a polished answer appearing from nowhere. Every chapter closes with practice and a fully written solution. If a sentence sounds impressive but does not help me solve or explain something, it does not belong here.

Daniel Mastick

Curriculum map, working notes, practice, and solutions

Course map

Week	Core thread	What should be solid by the end
1	Factor demand and income distribution	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
2	Intertemporal choice, saving, and capital	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
3	Choice under uncertainty	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
4	Exchange and general equilibrium	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
5	Production, efficiency, and welfare theorems	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
6	Static and dynamic games	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
7	Asymmetric information and contract design	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
8	Market design, externalities, and institutional choice	Reconstruct the model, work an application, test its assumptions, and explain the result in ordinary language.
9	Integration studio	Combine several chapters in one case, preserve their assumptions, and reconcile the result across representations.
10	Cumulative review	Retrieve the full course map from memory and solve mixed problems without chapter labels.

Scope anchor: <https://catalog.registrar.ucla.edu/course/2025/ECON101>. The sequence is aligned to the official catalog description and expanded into a practical ten-week study plan.

How I would use this packet

Treat each numbered section as one chapter. Read the formal explanation, pause at the student interpretation, and see whether the easy version still says the same thing. Rework the example without looking, then cover the solution in the chapter practice box. The cumulative set at the end is deliberately mixed: knowledge becomes durable when I have to choose the tool instead of being told which chapter I am in.

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CHAPTER 1 Factor demand and income distribution

The idea

Firms hire inputs until marginal revenue product matches marginal factor cost. Labor and capital demand depend on technology, output demand, substitution, market structure, and institutions; economic rent separates payment from opportunity cost.

Rebuild the chapter from first principles

The claim I need to own is this: Firms hire inputs until marginal revenue product matches marginal factor cost. Labor and capital demand depend on technology, output demand, substitution, market structure, and institutions; economic rent separates payment from opportunity cost. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of factor demand and income distribution. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach factor demand and income distribution on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from the course foundations to intertemporal choice, saving, and capital. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Firms hire inputs until marginal revenue product matches marginal factor cost.
- **What moves.** Labor and capital demand depend on technology, output demand, substitution, market structure, and institutions; economic rent separates payment from opportunity cost.
- **What keeps the answer honest.** The model becomes useful only when I can apply factor demand and income distribution to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

A wage is both a worker's income and a firm's input price, so I trace both sides of the market.

The easy version

Firms hire inputs until marginal revenue product matches marginal factor cost.

Worked example

Question. If marginal product is 5 units and output price is 12, what is competitive marginal revenue product?

Walkthrough. It is 60. A price-taking firm hires the input while the next unit costs no more than 60, subject to interactions with other inputs.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. If marginal product is 5 units and output price is 12, what is competitive marginal revenue product?

Solution. It is 60. A price-taking firm hires the input while the next unit costs no more than 60, subject to interactions with other inputs.

Practice 2. Explain factor demand and income distribution to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct factor demand and income distribution from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a factor demand and income distribution problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 2 Intertemporal choice, saving, and capital

The idea

Present value, Euler conditions, borrowing constraints, depreciation, and uncertainty connect current sacrifice to future consumption. Capital demand compares discounted marginal product with acquisition and user cost.

Rebuild the chapter from first principles

The claim I need to own is this: Present value, Euler conditions, borrowing constraints, depreciation, and uncertainty connect current sacrifice to future consumption. Capital demand compares discounted marginal product with acquisition and user cost. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of intertemporal choice, saving, and capital. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach intertemporal choice, saving, and capital on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from factor demand and income distribution to choice under uncertainty. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Present value, Euler conditions, borrowing constraints, depreciation, and uncertainty connect current sacrifice to future consumption.
- **What moves.** Capital demand compares discounted marginal product with acquisition and user cost.

- **What keeps the answer honest.** The model becomes useful only when I can apply intertemporal choice, saving, and capital to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I draw today and tomorrow as two goods; the interest rate is the slope of their tradeoff.

The easy version

Present value, Euler conditions, borrowing constraints, depreciation, and uncertainty connect current sacrifice to future consumption.

Worked example

Question. At a 5 percent rate, what is the present value of 105 next year?

Walkthrough. It is 100. Receiving 100 today and investing at 5 percent reproduces 105 next year.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. At a 5 percent rate, what is the present value of 105 next year?

Solution. It is 100. Receiving 100 today and investing at 5 percent reproduces 105 next year.

Practice 2. Explain intertemporal choice, saving, and capital to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct intertemporal choice, saving, and capital from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a intertemporal choice, saving, and capital problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent

check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 3 Choice under uncertainty

The idea

Expected utility combines state probabilities with utility curvature. Risk aversion, certainty equivalents, risk premia, insurance, diversification, and stochastic dominance separate expected payoff from preference over risk.

Rebuild the chapter from first principles

The claim I need to own is this: Expected utility combines state probabilities with utility curvature. Risk aversion, certainty equivalents, risk premia, insurance, diversification, and stochastic dominance separate expected payoff from preference over risk. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of choice under uncertainty. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.

- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach choice under uncertainty on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from intertemporal choice, saving, and capital to exchange and general equilibrium. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Expected utility combines state probabilities with utility curvature.
- **What moves.** Risk aversion, certainty equivalents, risk premia, insurance, diversification, and stochastic dominance separate expected payoff from preference over risk.
- **What keeps the answer honest.** The model becomes useful only when I can apply choice under uncertainty to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I calculate expected money and expected utility separately; confusing them erases risk attitude.

The easy version

Expected utility combines state probabilities with utility curvature.

Worked example

Question. A gamble pays 0 or 100 equally. Its expected value is 50. Why may a risk-averse person prefer less than 50 for sure?

Walkthrough. Concave utility makes utility of the expected payoff exceed expected utility of the gamble. The certainty equivalent lies below 50; the difference is the risk premium.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. A gamble pays 0 or 100 equally. Its expected value is 50. Why may a risk-averse person prefer less than 50 for sure?

Solution. Concave utility makes utility of the expected payoff exceed expected utility of the gamble. The certainty equivalent lies below 50; the difference is the risk premium.

Practice 2. Explain choice under uncertainty to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct choice under uncertainty from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a choice under uncertainty problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 4 Exchange and general equilibrium

The idea

An Edgeworth box represents feasible allocations, mutual gains, the contract curve, and competitive equilibrium. Prices coordinate excess demands across markets, and Walras' law links market-clearing conditions.

Rebuild the chapter from first principles

The claim I need to own is this: An Edgeworth box represents feasible allocations, mutual gains, the contract curve, and competitive equilibrium. Prices coordinate excess demands across markets, and Walras' law links market-clearing conditions. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of exchange and general equilibrium. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach exchange and general equilibrium on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from choice under uncertainty to production, efficiency, and welfare theorems. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** An Edgeworth box represents feasible allocations, mutual gains, the contract curve, and competitive equilibrium.
- **What moves.** Prices coordinate excess demands across markets, and Walras' law links market-clearing conditions.

- **What keeps the answer honest.** The model becomes useful only when I can apply exchange and general equilibrium to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

General equilibrium makes me account for the market that receives what another market gives up.

The easy version

An Edgeworth box represents feasible allocations, mutual gains, the contract curve, and competitive equilibrium.

Worked example

Question. What defines a Pareto-efficient interior allocation in a two-good exchange economy?

Walkthrough. Consumers' marginal rates of substitution are equal, so no feasible small trade can make one better off without hurting the other, subject to endowments and preference regularity.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. What defines a Pareto-efficient interior allocation in a two-good exchange economy?

Solution. Consumers' marginal rates of substitution are equal, so no feasible small trade can make one better off without hurting the other, subject to endowments and preference regularity.

Practice 2. Explain exchange and general equilibrium to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct exchange and general equilibrium from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a exchange and general equilibrium problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent

check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 5 Production, efficiency, and welfare theorems

The idea

Production possibility frontiers, marginal rates of transformation, and consumer marginal rates of substitution align at an efficient competitive allocation under strong assumptions. The welfare theorems separate efficiency from distribution through endowments and transfers.

Rebuild the chapter from first principles

The claim I need to own is this: Production possibility frontiers, marginal rates of transformation, and consumer marginal rates of substitution align at an efficient competitive allocation under strong assumptions. The welfare theorems separate efficiency from distribution through endowments and transfers. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of production, efficiency, and welfare theorems. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes,

the invariant breaks, or the model stops matching reality.

- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach production, efficiency, and welfare theorems on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from exchange and general equilibrium to static and dynamic games. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Production possibility frontiers, marginal rates of transformation, and consumer marginal rates of substitution align at an efficient competitive allocation under strong assumptions.
- **What moves.** The welfare theorems separate efficiency from distribution through endowments and transfers.
- **What keeps the answer honest.** The model becomes useful only when I can apply production, efficiency, and welfare theorems to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

Efficiency cannot tell me whether an allocation is fair; I keep those questions on separate lines.

The easy version

Production possibility frontiers, marginal rates of transformation, and consumer marginal rates of substitution align at an efficient competitive allocation under strong assumptions.

Worked example

Question. State the central condition for efficient product mix.

Walkthrough. Consumers' common marginal rate of substitution equals the economy's marginal rate of transformation, so willingness to trade goods matches the opportunity cost of producing them.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. State the central condition for efficient product mix.

Solution. Consumers' common marginal rate of substitution equals the economy's marginal rate of transformation, so willingness to trade goods matches the opportunity cost of producing them.

Practice 2. Explain production, efficiency, and welfare theorems to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct production, efficiency, and welfare theorems from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a production, efficiency, and welfare theorems problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 6 Static and dynamic games

The idea

Best responses, Nash equilibrium, subgame perfection, backward induction, repeated games, trigger strategies, and discounting explain strategic outcomes and credible threats.

Rebuild the chapter from first principles

The claim I need to own is this: Best responses, Nash equilibrium, subgame perfection, backward induction, repeated games, trigger strategies, and discounting explain strategic outcomes and credible threats. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of static and dynamic games. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach static and dynamic games on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from production, efficiency, and welfare theorems to asymmetric information and contract design. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Best responses, Nash equilibrium, subgame perfection, backward induction, repeated games, trigger strategies, and discounting explain strategic outcomes and credible threats.
- **What moves.** The model becomes useful only when I can apply static and dynamic games to an unfamiliar case and defend the assumptions.

- **What keeps the answer honest.** The model becomes useful only when I can apply static and dynamic games to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

My shorthand for this chapter is: my shorthand for this chapter is: a threat written in a strategy is not credible unless it remains optimal when its decision node arrives.

The easy version

Best responses, Nash equilibrium, subgame perfection, backward induction, repeated games, trigger strategies, and discounting explain strategic outcomes and credible threats.

Worked example

Question. Why does backward induction eliminate a noncredible threat?

Walkthrough. At the later subgame, the threatening player would not carry it out. Anticipating that future choice, earlier players ignore the threat, changing the equilibrium path.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. Why does backward induction eliminate a noncredible threat?

Solution. At the later subgame, the threatening player would not carry it out. Anticipating that future choice, earlier players ignore the threat, changing the equilibrium path.

Practice 2. Explain static and dynamic games to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct static and dynamic games from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a static and dynamic games problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output?

Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 7 Asymmetric information and contract design

The idea

Hidden types create adverse selection; hidden actions create moral hazard. Signaling, screening, incentive compatibility, participation, monitoring, and mechanism design shape feasible contracts.

Rebuild the chapter from first principles

The claim I need to own is this: Hidden types create adverse selection; hidden actions create moral hazard. Signaling, screening, incentive compatibility, participation, monitoring, and mechanism design shape feasible contracts. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of asymmetric information and contract design. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.

- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach asymmetric information and contract design on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from static and dynamic games to market design, externalities, and institutional choice. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Hidden types create adverse selection; hidden actions create moral hazard.
- **What moves.** Signaling, screening, incentive compatibility, participation, monitoring, and mechanism design shape feasible contracts.
- **What keeps the answer honest.** The model becomes useful only when I can apply asymmetric information and contract design to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

I ask whether information is hidden before the agreement or behavior is hidden after it.

The easy version

Hidden types create adverse selection; hidden actions create moral hazard.

Worked example

Question. How can a deductible address moral hazard?

Walkthrough. It leaves the insured party bearing part of the marginal loss or care cost, reducing overuse and precaution problems, but also weakens risk sharing.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. How can a deductible address moral hazard?

Solution. It leaves the insured party bearing part of the marginal loss or care cost, reducing overuse and precaution problems, but also weakens risk sharing.

Practice 2. Explain asymmetric information and contract design to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct asymmetric information and contract design from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a asymmetric information and contract design problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

CHAPTER 8 Market design, externalities, and institutional choice

The idea

Property rights, bargaining, corrective prices, auctions, matching, public goods, and regulation allocate scarce resources when ordinary price taking is incomplete. Institution design must consider information, incentives, enforcement, and distribution.

Rebuild the chapter from first principles

The claim I need to own is this: Property rights, bargaining, corrective prices, auctions, matching, public goods, and regulation allocate scarce resources when ordinary price taking is incomplete. Institution design must consider information, incentives, enforcement, and distribution. I do not count that as learned just because the sentence looks familiar. I should be able to name the objects, state what changes and what stays fixed, recover the rule from the definitions, and explain why the result is allowed.

The move

My working sequence

1. **Translate.** Rewrite the prompt in the language of market design, externalities, and institutional choice. List the known quantities, the unknown, the units or types, and any hidden constraint.
2. **Choose.** State the theorem, model, algorithm, accounting rule, or physical law before substituting values. This is where I make the assumption visible.
3. **Execute.** Work one justified step at a time and keep intermediate state readable enough that I can audit it later.
4. **Verify.** Check a boundary case, sign, unit, invariant, order of magnitude, or alternative derivation. Then translate the result back into an ordinary sentence.

Details I would refuse to skip

- **Definitions:** I should be able to define every technical noun in the chapter without using that same noun in the definition.
- **Assumptions:** I write the condition that makes the method legal beside the method itself. A correct procedure under the wrong assumptions is still a wrong answer.
- **Representation:** I move freely among words, equations or code, a diagram, and a small numerical example. If one representation disagrees with another, that disagreement is useful evidence.
- **Failure modes:** I keep the nearest counterexample in mind: the boundary where the rule changes, the invariant breaks, or the model stops matching reality.
- **Communication:** My final answer names what the result means and what it does not establish. I do not let notation do the explanatory work for me.

Sanity check

Closed-note check. Can I teach market design, externalities, and institutional choice on a blank page, derive or reconstruct its main rule, work a fresh example, and diagnose a deliberately broken solution? If I can only recognize the finished work, I am not done.

How this chapter connects

I read this chapter as the bridge from asymmetric information and contract design to the cumulative course model. The earlier material supplies the language and constraints; this chapter adds a new reasoning move; the later material asks me to use that move without being told its name. That connection matters because exams and real projects mix chapters on purpose.

The full working model

- **Core claim.** Property rights, bargaining, corrective prices, auctions, matching, public goods, and regulation allocate scarce resources when ordinary price taking is incomplete.

- **What moves.** Institution design must consider information, incentives, enforcement, and distribution.
- **What keeps the answer honest.** The model becomes useful only when I can apply market design, externalities, and institutional choice to an unfamiliar case and defend the assumptions.
- **Mastery standard.** I can define the objects, rebuild the rule, work a fresh case, compare alternatives, and diagnose a broken solution without relying on recognition.

How I actually think about it

My shorthand for this chapter is: my shorthand for this chapter is: the best theoretical mechanism can fail if it requires information nobody can truthfully supply.

The easy version

Property rights, bargaining, corrective prices, auctions, matching, public goods, and regulation allocate scarce resources when ordinary price taking is incomplete.

Worked example

Question. When does the Coase benchmark predict bargaining can internalize an externality?

Walkthrough. With well-defined rights, low transaction costs, feasible transfers, and adequate information, parties can bargain toward an efficient outcome, though the distribution depends on initial rights.

Common miss

The fastest way to get this chapter wrong is to use the visible procedure without naming its assumption, units, time period, reference group, or boundary. I put that condition beside the work and verify the result independently.

Solved chapter practice

Practice 1. When does the Coase benchmark predict bargaining can internalize an externality?

Solution. With well-defined rights, low transaction costs, feasible transfers, and adequate information, parties can bargain toward an efficient outcome, though the distribution depends on initial rights.

Practice 2. Explain market design, externalities, and institutional choice to a classmate using one definition, one concrete example, one assumption, and one failure mode.

Solution. Begin with the core claim above, use the worked case as the concrete example, state the condition highlighted by the warning, and choose a failure where that condition does not hold. A complete explanation connects all four pieces instead of listing them.

Mastery practice A. Reconstruct market design, externalities, and institutional choice from a blank page. Include the central definition, the governing rule, one required assumption, and one boundary case.

Solution. Start from the blue idea box, but rewrite it in my own words. Identify the objects and state, name the rule before using it, copy the relevant assumption from the details audit, and

choose a boundary where that assumption becomes equality or fails. A complete solution explains why each part belongs; a list of vocabulary is not enough.

Mastery practice B. A classmate gets a polished-looking answer to a market design, externalities, and institutional choice problem but never states a model or checks the result. Write the shortest useful review of that solution.

Solution. I would ask four concrete questions: What exactly are the inputs and desired output? Which rule licenses the main step? Which assumption could invalidate it? Which independent check supports the conclusion? If the answer cannot survive those four questions, I treat the numerical or verbal result as unverified.

Cumulative study plan

I use this packet in three passes. First I reconstruct each model and work its examples without looking. Second I mix chapters so the tool is no longer named for me. Third I explain a complete case aloud, including assumptions, units, uncertainty, failure modes, and what evidence would change my conclusion.