



Co-funded by the
Erasmus+ Programme
of the European Union



Reforming Master Programmes in Finance in Armenia and Moldova / REFINe

An Erasmus+ Capacity Building Project (2017-2020)

THE COURSE «MICROECONOMICS (ADVANCED COURSE FOR FINANCE)» OVERVIEW

Russian-Armenian (Slavonic) University
Irina Petrosyan, PhD in Economics, Associate Professor



BASIC INFORMATION



TITLE OF THE COURSE	MICROECONOMICS (ADVANCED COURSE FOR FINANCE)
TEACHERS	Irina B. Petrosyan, PhD in Economics, Associate Professor
YEAR OF THE COURSE	1st
SEMESTER OF THE COURSE	1st
LANGUAGE	Russian, English
NUMBER OF ECTS CREDITS	4

LEARNING OUTCOMES



The purpose of this course is to:

- Form the basis of economic thinking for students;
- To provide knowledge of advanced microeconomic concepts and models;
- To develop the ability to solve specific problems with their application;
- To instill the ability and desire to work independently with literature.

Studying the discipline *will also*:

- Enable students to develop skills in microeconomic analysis;
- Equip them with assessment methods and effective management techniques in a complex and constantly changing market environment.

LEARNING OUTCOMES



After passing the course, the student has:

- Use in practice the theoretical foundations of advanced microeconomics and its main concepts, as well as the theory and mathematical approaches of analyzing individual's behavior under uncertainty and risk, game theory, externalities and public goods theories, contract theory and firm's and individuals behavior theory in the terms of asymmetric information to substantiate financial decisions or solve financial problems;
- To operate the main variables used in advanced microeconomics, understand their economic sense, understand and implement advanced microeconomic models and their graphical representation *as well as their application in the sphere of finance*;
- To possess methods of solving typical practical problems and possess the skills of independent economic thinking;
- To be able to work independently with the literature recommended by lecturer, and have the skills to independently search for information.

SYLLABUS OF THE COURSE



WEEK	TOPIC
1	Uncertainty. Lotteries
2	Uncertainty. Risks
3	Game theory. Strategic form games
4	Game theory. Extensive form games. Repeated games. Cooperative games.
5	Externalities
6	Public goods
7	Asymmetric information. Adverse selection
8	Asymmetric information. Moral hazard
9	Signaling and screening as the ways to overcome asymmetric information

WEEK 1. Uncertainty. Lotteries



Uncertainty. Definition of the lottery. Assumptions on consumers perception. Lotteries for more than two prizes. Expected utility. Axioms on expected utility. Expected utility theorem. Uniqueness of the expected utility function.

More detailed description is presented in annex.

(see **Topic 1. Uncertainty**)

WEEK 2. Uncertainty. Risks



Definition of risk. Risk aversion. Expected utility of a gamble. Arrow-Pratt measure of (absolute) risk aversion. The acceptance set. The demand for insurance. Comparative statics of a simple portfolio problem. Comparative statics of a simple portfolio problem. Asset pricing.

More detailed description is presented in annex.

(see **Topic 1. Uncertainty**)

WEEK 3. Game theory. Strategic form games



Game theory definition and development history. Description of a game. Strategic form games. Assumptions on strategic form games. Examples of the games (Matching pennies, Prisoner's dilemma, Battle of sexes).

Cournot duopoly. Cournot-Nash equilibrium. Reaction curves. Bertrand duopoly.

Pure and mixed strategies. Cournot-Nash equilibrium for pure and mixed strategies.

More detailed description is presented in annex.

(see **Topic 2. Game Theory**)

WEEK 4. Game theory. Extensive form games

Repeated games. Cooperative games



Game tree. Defining strategies and outcomes in extensive form games. Subgames and subgame perfect equilibrium.

Repeated games. Finitely repeated game. Infinitely repeated game. Discussion of repeated games and cooperation.

Repeated games and subgame perfection.

More detailed description is presented in annex.

(see **Topic 2. Game Theory**)

WEEK 5. Externalities



Definition of externalities. An example of a production externality. Solutions to the externalities problem: Pigovian taxes, missing markets and property rights. The compensation mechanism. Efficiency conditions in the presence of externalities.

More detailed description is presented in annex.

(see **Topic 3. Externalities**)



WEEK 6. Public goods

Definition of public goods. Properties of public goods.

Efficient provision of a discrete public good. Private provision of a discrete public good. Voting for a discrete public good.

Efficient provision of a continuous public good. Private provision of a continuous public good.

Lindahl allocations. The Groves-Clarke mechanism. Clarke tax.

More detailed description is presented in annex.

(see **Topic 4. Public goods**)

WEEK 7. Asymmetric information.

Adverse selection



Adverse selection definition. Examples of hidden information. Market of lemons.

Basic model of adverse selection. Principal-agent problem. Delegation. Agency relationships. Technology, preferences and information

First best. Second best. Financial contracts under complete information. Financial contracts under asymmetric information.

More detailed description is presented in annex.

(see **Topic 5. Asymmetric information**)

WEEK 8. Asymmetric information.

Moral hazard



Moral hazard. Definition. Examples. Basic model. Main model under complete information. First bets. Incentive feasible contracts.

Basic model for risk neutrality and risk aversion.

Insurance contracts. Moral hazard in teams.

More detailed description is presented in annex.

(see **Topic 5. Asymmetric information**)

WEEK 9. Signaling and screening as the way to overcome asymmetric information



Using a signal. Education as a signal in labor markets (M. Spence). General structure of signaling (and cheap talk) game. Benchmark cases. Properties of signaling in markets.

Competitive screening. Properties of market screening.

More detailed description is presented in annex.

(see **Topic 5. Asymmetric information**)

TEACHING METHODOLOGY



- ✓ Course is designed *for 9 weeks*, during each week students will have *2 lectures* (duration of 1 lecture is 80 minutes).

- ✓ Course consists of:
 1. *Lectures* (all the lectures are in the form of slide show);
 2. *Discussion of key and the most difficult issues;*
 3. *Solution of exercises and tasks in class;*
 4. There are also supposed *homework assignments (problem sets)* to be solved individually.

LABOUR MARKET RELEVANCE



The course structure is built in the connection with the practice, so knowledge got from each topic can be used not only for solving theoretical issues, but also can be applied in the real economy, especially in taking strategic decisions if students are employed, for example, as financial managers, financial officers and etc.

This course contributes to the skills of operating in the terms of uncertainty and risks, analyze risks and implement elements of risk management *in the sphere of finance, especially*.

The course was designed with the elements of contract theory, so the students will have skills of drawing up optimal contracts with the employees if they are taking the position of manager or are the owners of business.

The course will be the most useful for the students who are going to continue their career *as a researcher*. But at the same time course gives fundamental knowledge of a wide range of categories that can be effectively used by the students in their further activities *in the sphere of finance*.

ASSESSMENT AND GRADING



The weights presented below combine into final grade for the course.

There *are two types* of assessment in this course:

- ❖ Current control (50%)
- ❖ Final exam (50%)

Current control considers:

1. **Home assignments** are the form of current control and their weight is 0,5 (50%)
2. **Discussions in the class** on the main issues of the topics has weight 0,5 (50%) and they are also a form of current control

So, together (1 and 2) they form midterm grade for the 9 weeks of the course.

ASSESSMENT AND GRADING



- ❖ Final exam consists of two theoretical questions and the solution of two problems.
- ❖ There is only **one re-take** for the final exam.
- ❖ The maximum number of points for each type of work and for the whole course is **100** points, the minimum is **40** points.
- ❖ The mark for the course is set on the basis of the following scale:

Points	From 88 to 100	From 74 to 87	From 64 to 73	From 63 to 54	From 40 to 54	From 20 to 39	Less than 20
Grade	A (excellent)	B (very good)	C (good)	D (fair)	E (satisfactory)	F (not satisfactory)	FX (not satisfactory)

REFERENCES



Primary Text

1. **Mas-Colell Andreu, Whinston Michael D., Green Jerry R.**, «Microeconomic Theory», Oxford University Press. 1995. 977 pages.
2. **Varian H.**, «Microeconomic Analysis», Third Edition. Norton&Company Inc.,1992. 559 pages

Secondary Text

1. **Frank Cowell**, «Microeconomics. Principles and Analysis», Second Edition, Oxford University Press. 2018. 656 pages.
2. **Geoffrey A. Jehle, Philip J. Reny**, «Advanced Microeconomic Theory (3rd Edition)». Prentice Hall. 2000. 560 pages.
3. **Gollier, C.**, «The Economics of Risk and Time», MIT Press. 2004. 443 pages.

COURSE ASSIGNMENT 1



Homework

Topic 1. A person has an expected utility function of the form $u(w) = fi$. He initially has wealth of \$4. He has a lottery ticket that will be worth \$12 with probability $1/2$ and will be worth \$0 with probability $1/2$. What is his expected utility? What is the lowest price p at which he would part with the ticket?

Topic 2. Consider an industry with 2 firms, each having marginal costs equal to c_0 . The (inverse) demand curve facing this industry is $P(Y) = 100 - Y$, where $Y = y_1 + y_2$ is total output.

- What is the competitive equilibrium level of industry output?
- If each firm behaves as a Cournot competitor, what is firm 1's optimal choice given firm 2's output?
- Calculate the Cournot equilibrium amount of output for each firm.
- Calculate the cartel amount of output for the industry.
- If firm 1 behaves as a follower and firm 2 behaves as a leader, calculate the Stackelberg equilibrium output of each firm.

COURSE ASSIGNMENT 1



Homework

Topic 3. A person has an expected utility function of the form $u(w) = \sqrt{w}$. He initially has wealth of \$4. He has a lottery ticket that will be worth \$12 with probability 1/2 and will be worth \$0 with probability 1/2. What is his expected utility? What is the lowest price p at which he would part with the ticket?

Topic 4. Suppose that two agents are deciding how fast to drive their cars. Agent i chooses speed x_i and gets utility $u_i(x_i)$ from this choice; we assume that $u_i(x_i) > 0$. However, the faster the agents drive, the more likely it is that they are involved in a mutual accident. Let $p(x_1, x_2)$ be the probability of an accident, assumed to be increasing in each argument, and let $c_i > 0$ be the cost that the accident imposes on agent i . Assume that each agent's utility is linear in money.

- Show that each agent has an incentive to drive too fast from the social point of view.
- If agent i is fined an amount t_i in the case of an accident, how large should t_i be to internalize the externality?
- If the optimal fines are being used, what are the total costs, including fines, paid by the agents? How does this compare to the total cost of the accident?
- Suppose now that agent i gets utility $u_i(x_i)$ only if there is no accident. What is the appropriate fine in this case?

COURSE ASSIGNMENT 1



Homework

Topic 5. Professor **P** has hired a teaching assistant, **Mr A**. Professor **P** cares about how many hours that **Mr. A** teaches and about how much she has to pay him. Professor **P** wants to maximize her payoff function, $x - s$, where x is the number of hours taught by **Mr. A** and s is the total wages she pays him. If **Mr. A** teaches for x hours and is paid s , his utility is $s - c(x)$, where $c(x) = x^2/2$. **Mr. A's** reservation utility is zero.

COURSE ASSIGNMENT 2



Classwork (discuss the question*)

Topic 1. What will the form of the expected utility function be if risk aversion is constant? What if relative risk aversion is constant?

Topic 2 (a). Why are there many equilibria in the finitely repeated Cournot game and only one in the finitely repeated Prisoner's Dilemma?

Topic 2 (b). Suppose that we have two firms with constant marginal costs of c_1 and two firms with constant marginal costs of c_2 , and that $c_1 > c_2$. What is the Bertrand equilibrium in this model? What is the competitive equilibrium in this model?

COURSE ASSIGNMENT 2



Classwork (discuss the question*)

Topic 3. Suppose, your upstairs neighbors throwing an awesome, but loud party.

1. Does an externality exist? If so, classify the externality as positive/negative (or both).
2. If an externality exists, determine whether the Coase theorem applies (i.e. is it possible/reasonably feasible to assign property rights and solve the problem?)
3. If an externality exists and the Coase theorem does not apply, argue which of the governments tools are best suited to address the issue: quantity regulation, taxes/subsidies, tradeable permits, or something else.

Topic 4. Does the Clarke tax result in a Pareto efficient allocation? Does the Clarke tax result in a Pareto efficient amount of the public good?

Topic 5. Suppose that in the hidden action principal-agent problem the agent is risk neutral. Show that the first-best outcome can be achieved.



THANK FOR ATTENTION

irina.petrosyan@rau.am