Программа учебной дисциплины «Добро пожаловать в теорию игр»

Разработчик	Стрижак Ульяна Петровна, доцент, Школа востоковедения
Число кредитов	3
Контактная работа (час.)	2
Самостоятельная работа (час.)	112
Курс, Образовательная программа	4 курс (Б), ОП «Востоковедение»
Формат изучения дисциплины	С использованием онлайн курса

1. Learning objectives, learning outcomes, pre-requisites

The purpose of the course "Welcome to Game Theory" is to introduce students to the basic ideas underlying the key concepts of game theory, such as equilibrium, rationality and cooperation. The course uses very little mathematics and it is ideal for those looking for a conceptual introduction to game theory. The objectives of the course are to:

- understand the meaning of business competition, political campaigns, the struggle for the existence of animals and plants, etc.;

- to view game theory as a kind of "game" in which people try to do their best against others;

- form an idea of key concepts in game theory and try to outline informal basic ideas that are often hidden behind mathematical definitions

В результате освоения дисциплины студент должен:

To know:

basic concepts of conceptual introduction to game theory;

the basic principles of understanding game theory applied to many disciplines including Economics, political science, psychology, sociology, biology, and computer science

To be able to:

it is logical to formulate, present and argumentatively defend one's own vision and applies to all disciplines

To use:

skills of setting goals and effective means of achieving them on the basis of analysis.

The course is taught at the 3rd year in the 1st module.

The learning format includes the online-course at the base of Coursera platform (URL: https://www.coursera.org/learn/game-theory-introduction#syllabus)

1. Course plan

Topic	Hours	Estimated results of learning the material	Control

				forms
	lct			
	sem			
	onl/slf			
Part 1 (module 1)				
Theme 1. Why do we need game theory, and what does it tell us?	0	Analyze a wide range of social and economic problems using a single structure		Test after the 1st week (10 minutes)
	0			
	25			
Theme 2. The concept of rational decision-making	0	Mastering the concept of rational decision-making (useful but not sufficient to provide guidelines). Motivated examples and some history of game theory		Test after the 1st week (10 minutes))
	0			
	25			
Theme 3. . The understanding of Nash equilibria	0	Understanding the specifics of the basic concept of solving game theory-Nash equilibrium. Understanding this Central concept with the help of various examples		Test after the 1st week (10 minutes)
	0			
	25			
Theme 4. How players come to Nash equilibrium	0	Consider the Nash equilibrium and the prisoner's dilemma. Understand the issues: Market competition Why do people come to play Nash equilibrium? Why do people come to play Nash equilibrium? Why do people come to play Nash equilibrium? Stylized facts and Nash equilibrium		Test after the 1st week (10 minutes)
	0			
	25			
Theme 5. Rationality, knowledge and evolution in games	0	Explanation of the relationship between rationality and Nash equilibrium. Consider the possible intellectual abilities of players, spanning the range from unlimited abilities for complex reasoning to absolutely zero intelligence.		Test after the 1st week (10 minutes)
	0			
	25			
Theme 6. Sustainable cooperation	0	Explanation of the most important and General message of game theory: rational behavior often leads to a socially undesirable outcome.		Test after the 1st week (10 minutes)
	0			
	25			
Debates				*2 hours*
Total number of hours (1 module)				lct -
				sem -
				onl/slf - 150

The formats of the learning:

lct (lections) – online

sem (seminars) – online

onl / slf – self-study of the students.

Topic description:

Раздел 1. Welcome to Game Theory

Theme 1.Why do we need game theory, and what does it tell us?
Analysis of a wide range of social and economic problems using a single structure
Theme 2. The concept of rational decision-making
Explaining the concept of rational decision making (useful but not sufficient to provide guidelines). Motivated examples and some history of game theory
Theme 3. The understanding of Nash equilibria
Discussion of the specifics of the basic concept of solving game theory-Nash equilibrium. Understanding this Central concept with the help of various examples.
Theme 4. How players come to Nash equilibrium
Discussion of the Nash equilibrium and the prisoner's dilemma.
Market competition
Stylized facts and Nash equilibrium.
Theme 5. Rationality, knowledge and evolution in games
An effective and clear explanation of the relationship between rationality and Nash equilibrium. Consider the possible intellectual abilities of players, spanning the range from unlimited abilities for complex reasoning to absolutely zero intelligence.
Theme 6. Sustainable cooperation
The main theme is to explain the most important and General message of game theory: rational behavior often leads to a socially undesirable outcome.

The main reason for this, and then look at how this understanding of game theory has had a fundamental impact on the natural and social Sciences

2. Grading system

The grading system includes In-class period control and Final control.

In-class control aims to organize the self-study work of the students and is carried out in the written form. It includes:

- Studying step by step the online course alongside with solving some tasks for each topic

- Successful completing of the online courses

Final control is carried out by taking part in the debates.

Before final grading the students must be got acquainted to the results of their participation in the debates.

Debates missed by a student for a good reason (illness, scientific or academic trip, participation in a conference, etc., documented to the training office), if agreed with the teacher, may not be taken into account and the weight will be redistributed to all elements of the online course control. The retake of the exam is possible in accordance with the "Regulation on the organization of intermediate certification and ongoing monitoring of student performance at the Higher School of Economics".

Blocking controls are not provided.

Grading formula:

$$G_{res} = 0{,}15{\cdot}G_{th.1} + 0{,}15{\cdot}G_{th.2} + 0{,}15{\cdot}G_{th.3} + 0{,}15{\cdot}G_{th.4} + 0{,}15{\cdot}G_{th.5} + 0{,}15{\cdot}G_{th.6} + 0{,}1{\cdot}G_{deb},$$

where G_{res}– resulting grade,

$G_{th.1}$ – summing grade for the theme 1, studied online,

$G_{th.2}$– summing grade for the theme 2, studied online,

$G_{th.3}$– summing grade for the theme 3, studied online,

$G_{th.4}$– summing grade for the theme 4, studied online,

$G_{th.5}$– summing grade for the theme 5, studied online,

$G_{th.6}$– summing grade for the theme 6, studied online,

G_{deb}– grade for taking part in debates,

If a student gets grade less than "4" (40), he doesn`t get an automatic failing grade, as this grade does not have a status of the blocking element and, due to the summing grade for the online course, this student gets his final result.

Table of correspondence of grades on a and five-point scale

Ten-point scale	Five-point scale
1 – very poor 2 – poor 3 –bad	Fail
4 – nearly satisficing 5 – satisficing	Marginal pass
6 – good 7 – very good	Good
8 – almost excellent 9 – excellent 10 – extremely excellent	Excellent

During monitoring, remote support is provided via e-mail. Grades on the current and final control can also be pre-communicated to students using electronic mailing. Formation of an assessment in a 10-point scale takes into account the scale of translation of estimates.

4. Examples of control types

4.1. Examples of the In-study control and Final control

4.1.1. Answer the theoretic questions:

Why do people come to play Nash equilibrium?

Why do people come to play Nash equilibrium?

Why do people come to play Nash equilibrium?

Group rationality and the rationality of the individual.

Why is group rationality different from human rationality?

Group rationality versus individual rationality in biological evolution

Group rationality versus the rationality of individuals in social thought

How to achieve socially desirable results?

Gas station cooperation in long-term relations: the Need for cooperation

Reputation And Trademark

5. Resources
a. Recommended basic literature

№п/п	Title
1	1. Stewart, J. Calculus - Early Transcendentals, 6th edition, 2008. 2. Avner Friedman. Advanced calculus. Dover publication, 1999. 3. K. Sydsaeter, P. Hammond, A. Seierstad, A. Strom. Further Mathematics for Economic Analysis. Prentice Hall/Financial Times,

b. Recommended optional literature

№п/п	Title
1	E. N. Barron and E N Barron, Game Theory : An Introduction, John Wiley & Sons, Incorporated, 2013.URL:https://ebookcentral.proquest.com/lib/hselibraryebooks/reader.action?docID=1157719 2. Harold William Kuhn, John von Neumann, Oskar Morgenstern, and Ariel Rubinstei, Theory of Games and Economic Behavior, Princeton University Press, 2007. URL: https://ebookcentral.proquest.com/lib/hselibrary-ebooks/reader.action?docID=1092486

c. Software support

№п/п	Title	Access demands
1.	Microsoft Windows 7 Professional RUS Microsoft Windows 10 MicrosoftWindows 8.1 Professional RUS	*Inner University access (according to contract)*
2.	Microsoft Office Professional Plus 2010	*Inner University access (according to contract)*

№п/п	Title	Accessdemands
Internet educational resources		
2.	Coursera	https://www.coursera.org/

5.1. Technical equipment for the discipline

Classrooms for lectures used during the discipline provide for necessary aims and demonstration of thematic illustrations corresponding to the program of the discipline:
PC with Internet access (operating system, office programs, antivirus programs);
multimedia projector with remote control.

Classrooms for seminars and self-study in the discipline are equipped with a personal computer, with Internet access and access to the electronic information and educational environment of the Higher School of Economics (LMS).

Computer classes are equipped with personal computers with Internet access, operating systems and software necessary for mastering the discipline.If necessary, it is allowed to replace equipment with its virtual counterparts.

6. Specifics of the organization for training people with disabilities.

If necessary, students with disabilities (at the request of the student) and for persons with limited abilities (at the request and also in accordance with an individual rehabilitation program for a disabled person), may be offered the following options for the perception of educational information taking into account their individual psychophysical characteristics, including using e-learning and remote technologies:

6.1.1. For persons with visual impairments: in print in large scale; in the form of an electronic document; in the form of an audio file (translation of training materials into audio format); in printed form in Braille; individual consultations with the involvement of a tiflos sign language interpreter; individual tasks and consultations.

6.1.2. for persons with hearing impairment: in print; in the form of an electronic document; video materials with subtitles; individual consultations involving an interpreter; individual tasks and consultations.

6.1.3. for persons with disorders of the musculoskeletal system: in printed form; in the form of an electronic document; in the form of an audio file; individual tasks and consultations.