

## **Syllabus**

**«Introduction to Neuroeconomics», Lecture materials, course structure and the syllabus are prepared by Vasily Klucharev**

Утверждена

Проректором С.Ю.Рощиным

от «25» июня 2018 г.

### **1. Course Description**

- a. « Introduction to Neuroeconomics»
- b. The course is based on the basic knowledge of social and natural sciences. There are no requirements of specific background knowledge.
- c. Course Type elective
- d. Economics, psychology, and neuroscience are converging today into a unified discipline of Neuroeconomics with the ultimate aim of providing a single, general theory of human decision making. Neuroeconomics provides economists and social scientists with a deeper understanding of how they make their own decisions, and how others decide. Are we hard-wired to be risk-averse or risk seeking? How is a “fair decision” evaluated by the brain? Is it possible today to predict the purchasing intentions of a consumer? Can we modulate economic behaviour affecting the brain? Neuroscience allied to psychology and economics have powerful models and evidence to explain why we make a decision. Decision-making in financial markets, trust and cooperation in teams, consumer persuasion, will be central issues in this course in neuroeconomics. You will be provided with the most recent evidence from brain-imaging techniques (PET, fMRI and TMS), and you will be introduced to the explanatory models behind them.

### **2. Learning Objectives**

Learning objectives of the “Introduction to Neuroeconomics” class are to provide students with the new multidisciplinary approach to study decision-making. Students will learn:

- 1 Assumptions of Neuroeconomics
- 2 Methods of Neuroeconomics
- 3 The functional role of various brain regions in decision-making
- 4 Evolutionary approach of Neuroeconomics
- 5 Neuroeconomics of decisions in groups

### **3. Learning Outcomes**

After completing the study of the “Introduction to Neuroeconomics” the student should:

- ✓ Know the brain models of decision making and choice, neuro-cognitive models of the choice: comparison with formal models of decision making
- ✓ Understand neural representation of the subjective value, basal ganglia and choice value.
- ✓ Understand the affective mechanisms of decision making
- ✓ Understand neural mechanisms of decision making under risk
- ✓ Understand social and evolutionary perspectives in Neuroeconomics

### **4. Course Plan**

Lecture 1: Introduction. Introduction to the course, historical overview of the field

Brain anatomy and functions. Introduction to neuroscience, brain anatomy and brain functions.

Lecture 2: Measuring brain activity: Brain-imaging (EEG, MEG, fMRI), brain stimulation (TMS), cell recording, data visualization, interpretation of the results.

Lecture 3: Introducing brain models of decision-making and choice. Neuro-cognitive models of the choice: comparison with formal models of decision-making.

Lecture 4: Neural representation of the subjective value, basal ganglia and choice value

Lecture 5: Behavioral economics foundation of Neuroeconomics

Lecture 6: Affective mechanisms of decision-making

Lecture 7: Dual process theory of decision-making

Lecture 8: Decision making under risk

Lecture 9: The social brain: Games in the brain.

Lecture 10: “Foraging theory” (economic behavior of animals)

Lecture 11: Taking an evolutionary perspective: the ‘economic animal’

Primate studies of economic behaviour. Animals’ economy - a model of human economy.

Lecture 12: “Neurophilosophy”

## **5. Reading List**

### **a. Required**

1. Neuroeconomics : decision making and the brain. Amsterdam : Academic Press, 2013
2. Politsner, Peter E. Neuroeconomics : A Guide to the New Science of Making Choices. Oxford: Oxford University Press. 2008.

### **b. Optional**

1. Hsu M; Lin HT, McNamara PE Neuroeconomics of decision-making in the aging brain: the example of long-term care / Advances In Health Economics And Health Services Research [Adv Health Econ Health Serv Res] 2008; Vol. 20, pp. 203-25.
2. Pessiglione, M., Delgado, M. R. The good, the bad and the brain: neural correlates of appetitive and aversive values underlying decision making / Neuroeconomics, Current Opinion in Behavioral Sciences. October 2015 5:78-84

## 6. Grading System

	Type of work	Characteristics	
		#	
Type of grading	Group Task (GT)	1	Making group presentations
	Class participation	2	Attendance of classes
	Final exam (FE)	3	Written exam, 120 min
Final	Grade formula	$0.3*GT + 0.7*FE$	

Note:

- **you cannot miss more than three classes**
- for Group Task you can assign a different number of points (not more than 10) to different group members to support the most active people. Example: 8 (Result of the Group X) x 5 (Number of people in the Group X) = 40 In this case you can distribute 40 points between group members depending on their contribution.

## 7. Guidelines for Knowledge Assessment

*The group task* consists of 15 min PowerPoint presentation followed by 15 min group discussion. The teacher can suggest additional tasks.

*Final assessment* is the final exam. Students have to demonstrate knowledge of neuroeconomics theory, studies and methods.

### Grading:

Group assignment (Group Task) with a presentation at the Seminar – 30% of final mark

Written exam – 70% of final mark

You cannot miss more than three classes.

The grades are rounded in favour of examiner/lecturer with respect to regularity of class and home works. All grades, having a fractional part greater than 0.5, are rounded up.

**Academic integrity policy** Cheating, plagiarism, and any other violations of academic ethics at HSE are not tolerated.

### Table of Grade Accordance

Ten-point Grading Scale	Five-point Grading Scale	
1 - very bad 2 – bad	Unsatisfactory - 2	<b>FAIL</b>

3 – no pass		
4 – pass 5 – highly pass	Satisfactory – 3	<b>PASS</b>
6 – good 7 – very good	Good – 4	
8 – almost excellent 9 – excellent 10 – perfect	Excellent – 5	

## 8. Methods of Instruction

The following educational technologies are used in the study process:

- lectures
- discussion and analysis of the results of the home task;
- individual education methods, which depend on the progress of each student;

Students are required to show active participation in the course by giving presentations and by handing in questions about the literature before the start of each class. The basic concepts of the course will be examined by a written exam. Also, small teams of students will work on a literature study of their own choice that will be presented at the end of the course.

## 9. Special Equipment and Software Support (if required)

The course requires no special equipment