Course Syllabus

Title of the course	**Mechanism Design**
Title of the Academic Programme	BA in Economics
Type of the course	Elective, available to foreign students
Prerequisites	Game theory
ECTS workload	3

Total indicative study hours	Directed Study	Self-directed study	Total
	36	78	114

Course Overview	Mechanism design is a science of how to construct economic mechanisms (rules, environments, institutions) with desirable properties. While the usual microeconomic approach aims at understanding how agents behave in certain environments given certain rules, Mechanism design aims at finding "good" rules that lead to desirable outcomes. At the same time the rules themselves have to be simple and non-manipulable, i.e. provide incentives to participate sincerely. Mechanism design uses game theory tools and can be considered as its most applied part. The range of applications is very broad: from auctions and internet marketplaces to admission of young students to colleges, voting mechanisms, online dating services, and many others. The course will provide an overview of general methods used to design mechanisms in different areas of life.
Intended Learning Outcomes (ILO)	Know types of games and solution concepts Understand the main concepts and properties of mechanism design Know standard auction forms and able to find optimal bidding functions Know Revenue Equivalence Theorem, its assumptions and applications Able to define and apply fair division, assignment, matching and voting mechanisms; know properties of these mechanisms Able to identify deficiencies in real-life markets
Teaching and Learning Methods	The course consists of lectures (24 hours) and tutorials (12 hours). The tutorials involve solving problems and proving theoretical results.

Content and Structure of the Course

№	Topic / Course Chapter	Total	Directed Study		Self-directed Study
			Lectures	Tutorials	
1	Introduction to voting. Basic voting rules and their properties.	19	4	2	13
2	Independence of irrelevant alternatives and its relaxations. Arrow's impossibility theorem.	19	4	2	13
3	VCG--mechanisms. Auctions.	19	4	2	13
4	Matching and assignment mechanisms: dictatorships, core, serial, deferred, and immediate acceptance.	19	4	2	13

5	Introduction to Computational social choice.	19	4	2	13
6	Bargaining. Claims problem.	19	4	2	13
Total study hours		114	24	12	78

Indicative Assessment Methods and Strategy	Students' progress will be measured by 4 tests (each contribute 10% to the final grade), final exam will take 2 hours (theoretical question, and five problems to solve) and contribute 60% to the final grade.
Readings / Indicative Learning Resources	<u>Mandatory</u> F. Brandt,V. Conitzer, U. Endriss, J. Lang, A. Procaccia, H. Moulin. (2016) *Handbook of Computational Social Choice.* Cambridge, available at: http://procaccia.info/the-handbook-of-computational-social-choice-has-been-published/ <u>Optional</u> P. Klemperer. (2004) *Auctions: theory and practice.*, available at: http://www.nuff.ox.ac.uk/users/klemperer/VirtualBook/VirtualBookCoverSheet.asp A. Roth, M. Sotomayor. (1992) *Two-Sided Matching: A Study in Game-Theoretic Modeling and Analysis*, available at: https://web.stanford.edu/~alroth/papers/92_HGT_Two-SidedMatching.pdf

Indicative Self- Study Strategies	**Type**	**+/−**	**Hours**
	Reading for seminars / tutorials (lecture materials, mandatory and optional resources)	+	52
	Assignments for seminars / tutorials / labs		
	E-learning / distance learning (MOOC / LMS)		
	Fieldwork		
	Project work		
	Other (please specify)		
	Preparation for the exam	+	26

Academic Support for the Course	Academic support for the course is provided via LMS, where students can find: guidelines and recommendations for doing the course; guidelines and recommendations for self-study; samples of assessment materials
Facilities, Equipment and Software	
Course Instructor	Aleksei Kondratev

Course Content

1. Introduction to voting. Basic voting rules and their properties.
2. Independence of irrelevant alternatives and its relaxations. Arrow's impossibility theorem.
3. VCG--mechanisms. Auctions.
4. Matching and assignment mechanisms: dictatorships, core, serial, deferred, and immediate acceptance.
5. Introduction to Computational social choice.
6. Bargaining. Claims problem.

Assessment Methods and Criteria

Assessment Methods

Types of Assessment	Forms of Assessment	Modules			
		1	**2**	**3**	**4**
Formative Assessment	Test	*			
Summative Assessment	Exam	*			

Assessment Criteria

Written Assignments (Essay, Test/Quiz, Written Exam, etc.)

Grades	Assessment Criteria
«Excellent» (8-10)	Has a clear argument, which addresses the topic and responds effectively to all aspects of the task. Fully satisfies all the requirements of the task; rare minor errors occur;
«Good» (6-7)	Responds to most aspects of the topic with a clear, explicit argument. Covers the requirements of the task; may produce occasional errors.
«Satisfactory» (4-5)	Generally addresses the task; the format may be inappropriate in places; display little evidence of (depending on the assignment): independent thought and critical judgement include a partial superficial coverage of the key issues, lack critical analysis, may make frequent errors.
«Fail» (0-2)	Fails to demonstrate any appropriate knowledge.

Recommendations for students about organization of self-study

Self-study is organized in order to:
- Systemize theoretical knowledge received at lectures;
- Extending theoretical knowledge;
- Learn how to use legal, regulatory, referential information and professional literature;
- Development of cognitive and soft skills: creativity and self-sufficiency;
- Enhancing critical thinking and personal development skills;
- Development of research skills;
- Obtaining skills of efficient independent professional activities.

Self-study, which is not included into a course syllabus, but aimed at extending knowledge about the subject, is up to the student's own initiative. A teacher recommends relevant resources for self-study, defines relevant methods for self-study and demonstrates students' past experiences. Tasks for self-study and its content can vary depending on individual characteristics of a student. Self-study can be arranged individually or in groups both offline and online depending on the objectives, topics and difficulty degree. Assessment of self-study is made in the framework of teaching load for seminars or tests.

Special conditions for organization of learning process for students with special needs

The following types of comprehension of learning information (including e-learning and distance learning) can be offered to students with disabilities (by their written request) in accordance with their individual psychophysical characteristics:
1. *for persons with vision disorders:* a printed text in enlarged font; an electronic document; audios (transferring of learning materials into the audio); an individual advising with an assistance of a sign language interpreter; individual assignments and advising.
2. *for persons with hearing disorders: a* printed text; an electronic document; video materials with subtitles; an individual advising with an assistance of a sign language interpreter; individual assignments and advising.
3. *for persons with muscle-skeleton disorders: a* printed text; an electronic document; audios; individual assignments and advising.