Course Syllabus

Title of the course	**Mechanism design**		
Title of the Academic Programme	MA in Applied Economics and Mathematical Methods		
Type of the course	Elective, available to foreign students		
Prerequisites	Game Theory, Intermediate Microeconomics		
ECTS workload	5		
Total indicative study hours	Directed Study	Self-directed study	Total
	38	114	152
Course Overview	The course covers key topics in Mechanism Design, including voting, matching, fair division, and auctions. The course culminates in an introduction to Implementation Theory where a uniform framework for these problems is examined.		
Intended Learning Outcomes (ILO)	1) Students will know the three main classes of voting rules and understand their trade-offs. 2) Students will be familiar with one-sided and two-sided matching models, the SD, TTC, and DA mechanisms, and their properties. 3) Students will be able to define notions of fairness in the cake-cutting model and understand the difference between constructive and non-constructive mechanisms in that field. 4) Students will be able to apply the revenue equivalence theorem and compute VCG allocations. 5) Students will understand the necessary and sufficient conditions for implementation, and how this relates to the previous topics.		
Teaching and Learning Methods	The course consists of 20 hours of lectures and 18 of tutorials. The lectures will be used to cover the course material, the tutorials to revise and to study key papers in the field.		

Content and Structure of the Course

№	Topic / Course Chapter	Total	Directed Study		Self-directed Study
			Lectures	**Tutorials**	
1	Voting. Voting rules, their properties, and impossibilities.	29	4	6	19
2	Matching. House allocation, stable marriage.	27	4	4	19
3	Fair division. Cake cutting mechanisms.	23	2	2	19
4	Auctions. Sealed bid auctions, relevance equivalence, VCG.	25	4	2	19
5	Implementation theory. Maskin Monotonicity, Revelation Principle.	23	2	2	19
6	Extra topics.	25	4	2	19

Total study hours		152	20	18	114
Indicative Assessment Methods and Strategy	The course has two homework assignments and final exam. The weight of the homework assignments is 0.3 each, of the exam 0.4. The course grade is given by the formula: $G = 0.3H1 + 0.3H2 + 0.4E$				
Readings / Indicative Learning Resources	<u>Background</u> Steven Tadelis, Game Theory: An Introduction. Princeton University Press, 2013. Particularly chapter 12. <u>Voting</u> Young, H. (1988). Condorcet's Theory of Voting. American Political Science Review, 82(4), 1231-1244. doi:10.2307/1961757. <u>Fair division</u> Egor Ianovski, Cake-cutting mechanisms. https://arxiv.org/abs/1203.0100. Chapters 2 and 3. <u>Auctions</u> Steven Tadelis, Game Theory: An Introduction. Princeton University Press, 2013. Chapter 13 and 14. <u>Implementation</u> Maskin E, Sjöström T. Implementation Theory. In: Arrow K, Sen A, Suzumura K Handbook of Social Choice Theory Vol. I. Amsterdam: North Holland ; 2002. pp. 237-288.				

Indicative Self- Study Strategies	**Type**	**+/−**	**Hours**
	Reading for seminars / tutorials (lecture materials, mandatory and optional resources)	+	40
	Assignments for seminars / tutorials / labs	+	34
	E-learning / distance learning (MOOC / LMS)		
	Fieldwork		
	Project work		
	Other (please specify)		
	Preparation for the exam	+	40

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	(If required)

Course Instructor	Egor Ianovski

Intended Learning Outcomes (ILO) Delivering

Programme ILO(s)	Course ILO(s)	Teaching and Learning Methods for delivering ILO(s)	Indicative Assessment Methods of Delivered ILO(s)
УК-1: Способен оценивать и перерабатывать освоенные научные методы и способы деятельности	1,2,3,4,5	Lectures, tutorials, course reading	Assignments, exam
ОПК-2: Способен обобщать и критически оценивать результаты, полученные отечественными и зарубежными исследователями, выявлять перспективные направления, составлять программу исследований	1,2,3	Lectures, tutorials	Assignments, exam
ПК-2: способен обосновывать актуальность, теоретическую и практическую значимость избранной темы научного исследования	1,3,4	Lectures, tutorials, course reading	Assignments, exam
ПК-4: способен представлять результаты проведенного исследования научному сообществу в виде статьи или доклада	1,2,5	Lectures, tutorials, course reading	Assignments
ПК-8: способен	1,4,5	Lectures, tutorials, course	Assignments, exam

разрабатывать стратегии поведения экономических агентов на различных рынках		reading	

Course Content

1) Voting. Three classes of voting rules and their properties. Arrow and the Gibbard-Satterthwaite.

2) Matching. House allocation, serial dictatorship, top trading cycle. Stable marriage, Gale-Shapley.

3) Fair division. Concepts of fairness. Robert-Webb protocols for cake-cutting.

4) Auctions. First and second-price auctions. Revenue equivalence. VCG mechanisms.

5) Implementation theory. Maskin Monotonicity. Revelation Principle.

6) Extra topics. Condorcet's jury theorems. Bayesian games.

Assessment Methods and Criteria

Assessment Methods

Types of Assessment	Forms of Assessment	Modules			
		1	**2**	**3**	**4**
Formative Assessment	Assignment 1	*			
Interim Assessment	Assignment 2	*			
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.