

## Syllabus

### CONTRACT THEORY BSc - 3 year Modules 3,4 2019-20

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**Instructor:** Tatiana Mayskaya

**Course Description:** This course provides an overview of the classical as well as advanced topics in contract theory. We are going to start with the classical principal-agent models of screening and moral hazard and learn how managers create incentives for their employees. These models involve two parties: a principal (e.g. manager) and an agent (e.g. employee). The principal delegates a task to the agent by offering him a contract. In the moral hazard problem, the agent's actions are hidden (non-contractible), yet they affect an outcome that *can* be included in a contract. In the screening problem, the agent has some private information relevant to the task. In both problems, asymmetric information creates inefficiency. In the second part of the course we consider various extensions of these two problems to many agents and dynamic environment. At the end of the course we'll shift gears to a different area of market design and learn how to get married (matching theory).

**Pre-requisites:** Calculus, Probability Theory, Mathematics for Economists. This course deepens students' understanding of the last part of Microeconomics-2 course, market failure and efficiency.

**Learning Objectives & Outcomes:** At the conclusion of the course, students should be able to:

- identify real life situations where the studied concepts (adverse selection and moral hazard) are applicable;
- describe main trade-offs the principal is facing when designing an optimal contract;
- understand books and papers that contain economic theories based on studied concepts;
- solve models with a given setup related to studied concepts.

**Methods of Instruction:** lectures, seminars, home assignments.

**Reading List:**

1. Patrick Bolton and Mathias Dewatripont. *Contract Theory*. MIT Press, 2005.
2. Alvin E. Roth and Marilda A. Oliveira Sotomayor. *Two-sided Matching: A Study in Game-Theoretic Modeling and Analysis*. Cambridge University Press, 1992.
3. Andreu Mas-Colell, Michael D. Whinston, Jerry R. Green. *Microeconomic Theory*. Oxford University Press, 1995.

**Special Equipment:** projector, Internet connection, whiteboard.

**Grading System and Examination Type:**

$$\text{Final grade} = 0.5 * (\text{exam grade}) + 0.25 * (\text{midterm grade}) + 0.25 * (\text{homeworks})$$

The midterm is based on *adverse selection* and *moral hazard* topics. The exam is based on the whole course, with the emphasis on the *advanced topics* and *matching theory*.

All grades are given initially out of 100. The final grades are also transferred to 10- and 5-points grades in accordance with the [ICEF Grading Regulations](#) (par. 3).

Retakes are organized in accordance with the [HSE Interim and Ongoing Assessment Regulations](#) (incl. Annex 8 for ICEF). Grade determination after retakes is done in accordance with [ICEF Grading Regulations](#) (par. 5).

**Course Outline:**

1. *Adverse selection.*

Screening model with two types. Application to the seller-buyer, lender-borrower, employer-employee. Extensions: ex ante contracting, limited liability, different outside options, optimal income taxation.

2. *Moral hazard.*

Simple model with binary outcome and binary action. Linear contracts. Multitasking.

3. *Advanced topics.*

Moral hazard in teams. Career concerns. Relational contracts.

4. *Matching theory.*

Deferred acceptance algorithm. Lattice structure of stable matchings. Strategy-proofness: impossibility result. Many-to-one matching.

	Topic	Total Hours	Contact Hours	
			Lectures	Seminars
1	Adverse selection	16	8	8
2	Moral hazard	16	8	8
3	Advanced topics	16	8	8
4	Matching theory	12	6	6
	Total	60	30	30