# Game Theory with Applications to Finance and Marketing, II

## Course Syllabus, Spring 2015

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This course is a sequel to the course *Game Theory with Applications to Finance and Marketing, I*, and it will review the major ingredients of contract theory. The intended audiences are graduate students who have taken Game Theory with Applications to Finance and Marketing, I or some graduate-level game theory course, and who are interested in applying game theory to contract or institutional design in the fields of finnance and/or marketing. After giving a brief introduction to the implementation theory, we shall selectively cover some topics in the two books below:

1. Jean-Jacques Laffont and David Martimort, 2002, The Theory of Incentives, New Jersey: Princeton University Press.

2. Oliver Hart, 1995, Firms, Contracts, and Financial Structure, London: Oxford University Press.

We shall cover chapters 2,3,4,8,and 9 in Laffont and Martimort (2002) and several chapters of Hart (1995). The following is an overview of the materials in Laffont and Martimort (2002) to be covered in this course.

1. Chapters 2 and 3 cover static adverse selection problem. Chapter 2 lays out the basic problem with the informed agent having two types. It proves the revelation principle and applies it to various problems in section 2.15. It emphasizes the different roles of ex-ante and ex-post participation constraints, and briefly considers random schemes. Chapter 3 considers an informed agent with more than 2 types, with

multi-dimensional private information, or with type-dependent or random participation constraint. The materials there are then applied to the costly state verification (CSV) financial contracting problem.

2. Chapter 4 considers the static moral hazard problem. Chapter 4 considers an agent who is either risk averse or is risk neutral but protected by limited liability. In this chapter, the agent has two effort choices, and is delegated with a single task. The theory has various applications in section 4.8, and it is related to the theory of the firm.

3. Chapter 8 considers repeated adverse selection.

4. Chapter 9 considers incomplete contracts and the hold-up problem.

There will be homework assignments due regularly, which together with an in-class midterm and oral presentation (of an assigned paper in either finance or marketing) determine a student's grade. The following is a tentative schedule.

| Week no. | Contents |
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| 1 | Chapter 2 of LM |
| 2 | Chapter 2 of LM continued |
| 3 | Chapter 3 of LM |
| 4 | Chapter 3 of LM continued |
| 5 | Chapter 4 of LM |
| 6 | Chapter 4 of LM continued |
| 7 | Chapter 8 of LM |
| 8 | Chapter 8 of LM continued |
| 9 | Chapter 9 of LM continued |
| 10 | Midterm Examination |
| 11-16 | Hart's Book |
| 17-18 | Oral Presentation |