

**STELLENBOSCH UNIVERSITY
DEPARTMENT OF ECONOMICS
ECONOMICS 318: GAME THEORY
COURSE OUTLINE**

- 1) **Lecturer:** Melt van Schoor
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2) **OBJECTIVES AND LEARNING OUTCOMES**

Game Theory is a mathematical method that allows us to analyze situations where strategic interaction between different agents take place, in other words where an individual's outcome depends on the actions of other agents, and other agents' actions can depend on the individual's actions. Game Theory has become prominent in economics in past years because it enables us to analyze situations that fall outside the standard framework of perfect competition, perfect and complete information and abstract markets.

This sub-module aims to introduce the student to basic theoretic concepts in game theory, with applicable examples. Upon completion of the course, students should be familiarized with basic game theoretic concepts and methods, classification of games and different equilibrium concepts. Students should also be able to analyze situations with strategic aspects that arise in microeconomic theory and in general. Students should also be aware of the empirical relevance of the theory, and we will therefore reference experimental and other evaluations that have been conducted by game theorists. A number of specific examples and applications will be investigated in more depth and we will also consider selected more advanced concepts.

3) **PRESCRIBED LITERATURE**

The prescribed textbook (available at Van Schaiks and also Protea bookshops; secondhand copies may also be available) is:

Dixit, A., Skeath, S. & Reily, D., 2009. Games of Strategy. 3rd edition. W. W. Norton & Company. USA.

OR

Dixit, A., Skeath, S. & Reily, D., 2015. Games of Strategy. 4th edition. W. W. Norton & Company. USA.

Additional prescribed material will be made available electronically. Class notes and discussions as well as tutorials are also considered prescribed material for test and exam purposes.

4) **LECTURES AND TUTORIALS**

Lectures as well as tutorials are compulsory. Lectures will generally be used for more theoretic and sometimes abstract work, while tutorials will focus on technical aspects, concrete examples and problems.

Students are expected to keep up with the lectures and do the necessary preparation before and after lectures. The lectures will not cover all of the prescribed work in

detail, students should therefore be prepared to study certain portions on their own as will be indicated.

Tutorial assignments will be made available beforehand and students will be expected to complete them beforehand and bring solutions to the tutorials. Some tutorial timeslots will be used for further assessments (see below); students will be informed beforehand by email when this will occur and what form the tutorial assessments will take. Each student will be allocated to a weekly timeslot for game theory tutorials following an electronic registration process; students are expected to remain in their allocated timeslots and keep this timeslot open. There may not be tutorials every week – announcements will be made during lectures and by email beforehand.

5) **ASSESSMENT**

Game theory will be assessed in assessments A2 and A3. Students will be assessed on their knowledge and skills obtained in the lectures, tutorials, through the study of the textbook as well as additional material that will be prescribed. In addition, there is a FAS component for game theory tutorials making up 2.5% of the final mark (see above).

Students must meet an attendance and minimum competency level in the tutorials to pass the module. (Please see “Specific Information for Third Year Modules” on SunLearn for details.)

6) **COMMUNICATION**

There are no specific consultation times, students are welcome to knock on my door at any time. Students that want to be assured of a consultation are requested to make an appointment by email. Course material and information will be placed on SUNLearn. Students must monitor their email regularly for important communication regarding the course.

7) **SCHEDULE**

Below is a preliminary schedule of the topics that will be covered. Adjustments will be made during the course of the semester. (DSR refers to the prescribed textbook.)

Lecture(s)	Topic(s)	DSR 3rd ed	DSR 4th ed
1-2	Introduction; Hotelling location model*; Game theory basic concepts	1-2	
2-3	Games with sequential moves	3	
4-7	Simultaneous-moves games with pure strategies	4-5	
8	Subgame perfect equilibrium (and other topics)	6	
9	Risk and expected utility	7 (appendix)	
10-12	Mixed strategies	7-8	7
13	Uncertainty and information	9	8
14	Strategic moves	10	9
15	The Prisoners' Dilemma and repeated games; Axelrod's tournaments*	11	10
16	Experimental game theory*		
17	Evolutionary game theory	13	12

* Additional material will be prescribed

8) **LANGUAGE OF INSTRUCTION**

The language of instruction for this submodule is the same as for the module overall. Please see “Specific Information for Third Year Modules” on SunLearn for details.