

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

1) **LECTURER:** Melt van Schoor (email: mpvs@sun.ac.za)

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**

There is no prescribed textbook for this submodule. Prescribed materials include lectures (e.g. provided lecture slides as well as your own notes based on lectures), assignments, tutorials, additional written notes, academic articles and any other material prescribed by the lecturer during the course. Prescribed materials and information will be placed on Sunlearn.

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. Due to COVID19, we use a hybrid model where some students can come to class and others connect online via a live stream on MS Teams. While recordings are also provided afterwards, this should be regarded purely as a backup option, to be used in case of e.g. load shedding or Internet connectivity problems. Successful study in this course will require active, live participation in lectures.

Students are expected to 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.

The aim of the game theory **tutorial programme** is to develop a deeper understanding of the practical application of the theory and problem solving skills. Tutorials will take the form of a weekly tutorial assignment, each containing a number of problems to solve. Students must complete these assignments and upload their answers to Sunlearn by the indicated deadlines. Following this, there will be opportunities for asking questions (the format and times of these sessions still to be determined) and

feedback will be provided in various formats, e.g. online meetings, written, audio or video. Committed preparation and working out of tutorial assignments before the deadlines, followed by careful review of feedback and following up on any remaining questions are important for successful study in this course.

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 and through the study of the prescribed material.

In addition, there is a FAS component for game theory making up 2.5% of the module's final mark. This will take the form of one or more online assessments, the details of which will be communicated ahead of time.

Students must meet FAF participation and minimum competency requirements (see details in general module outline). This will be assessed based on tutorial assignments submitted by the relevant deadlines.

6) COMMUNICATION

Students are responsible for monitoring their email addresses regularly for important announcements and course information.

A game theory question and answer (Q&A) forum will operate on SunLearn for the duration of the course. Students can post questions about any topic related to the course (either administration or content) and students may also answer questions or discuss the issues further. The lecturer will monitor the forum and provide answers to unanswered questions. Students are particularly encouraged to post questions that may be of benefit to other students as well on the forum.

Students may email the lecturer to request individual consultations, which will take place using MS Teams.

7) SCHEDULE

Below is a preliminary schedule of the topics that will be covered. Any changes that may be made will be communicated in the lectures.

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

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.