MAT109
Introduction to Game Theory
Department of International Management
Spring 2019

I. COURSE INFORMATION

Instructor: Erich Prisner
eprisner@fus.edu
Office Hours:
M 16:00-17:30, 17:15-17:45
T 10:15-11:15,
Th 12:00-13:00,
and by appointment, LAC 11
Class location: LAC 2
Class Meeting times: MTh 14:30-15:45
Final: Thursday May 9, 13:30-15:30

II. COURSE DESCRIPTION

This course is an elementary introduction to Game Theory. It focuses on how to analyze situations and make rational decisions based on the information gathered. We will analyze parlor games, gambling, and real-world situations. As mathematical basis for the analysis, Probability Theory and some Algebra are needed, but will be developed in detail. the power and validity of these methods, of the paradigms of rational agents, of quantifiability of different outcomes will also be questioned critically.

III. RATIONALE

By completing MAT109, students satisfy the Mathematics core requirement. The course can also count towards the Minor in Applied Mathematics.

IV. COURSE GOALS

The goals are to make students familiar with formal (mathematical) analysis of real-world situations and with a selected part of the most important concepts and methods of Game Theory and Probability. Students should see that this approach can be applied in many real-world situations. Furthermore, the students should also develop problem-solving skills, applying some of the methods learned, and become able to communicate orally and in written form.

V. SPECIFIC LEARNING OUTCOMES

On completion of the course students should
- Be familiar with the basic concepts and techniques used in Game Theory,
- Be able to model real-life situations using these tools from Game Theory, and also be able to critically evaluate the results obtained.

- Have gained an understanding of the power, but also of the assumptions and limitations of this approach.
- Be able to apply some of the ideas and techniques learned to solve problems themselves.
- Be able to generate data using predefined formulas and be able to draw meaningful conclusions from this data.
- Have made progress in communicating mathematical and other ideas and concepts both orally and in written form.

VI. REQUIRED TEXTS AND MATERIALS

Game Theory Through Examples, by Erich Prisner, MAA Classroom Resource Materials 2014, Electronic ISBN: 9781614441151,
(https://bookstore.ams.org/clrm-46)

VII. ASSESSMENT OVERVIEW

At the end of the semester, you will receive a score from 0 to 100%, based on the following:

- Warm-Ups: 10 %
- Participation: 10 %
- Homework: 15 %
- Writing project: 20 %
- Midterms I and II: 15 %
- Final: 30 %

nonattendance may lower your score as described below.

VIII. ASSESSMENT DETAILS

Warm Ups:
For many classes there are warm-ups assigned. You have to discuss an issue electronically before class on MOODLE. No exception for the deadline will be given for any reason, also submission has to be electronically!

Participation:
Your participation is very important in this course, both for the sake of the course as well as for the sake of your success in achieving the objectives. Participation includes in-class activities, like playing games, class discussion, asking questions, contributing facts, but some of these activities also rely on some work (looking up some facts and sharing them during class) done before class.

Homework:
Homework will be assigned almost every week. It will be collected, part of it graded, and returned. No late homework will be accepted, unless evidence of a medical (or other serious) problem is presented. You are allowed (and encouraged) to work in groups and to discuss homework assignments, but everything submitted must be your own work. Some homework will be required in typed form. The homework is also individualized as every student gets different questions to work on.

Writing Project:
Each student has to finish a writing project. In these projects students should model, solve, and discuss real-world situations or games.

Two Midterms and a Final
There will two midterm tests of about 45 minutes each. No make-up tests are given, unless there is evidence of a medical (or other serious) problem. We also have a final exam in the final week.

Attendance:
Regular attendance is required. You can miss 4 classes without penalty, but I will subtract 5% from your score for each further missed class.

IX. GRADING POLICIES AND EXPECTATIONS

Final grades will be determined as follows:

	A: 93 - 100 %	A-: 90 - 92.9 %
B+: 87 - 89.9 %	B: 83 - 86.9 %	B-: 80 - 82.9 %
C+: 77 - 79.9 %	C: 73 - 76.9 %	C-: 70 - 72.9 %
D+: 67 -69.9 %	D: 63 - 66.9 %	D-: 60 - 62.9 %
F: below 60 %		

X. HOW TO DO WELL IN THIS COURSE (POLICIES / REQUIREMENTS)

To be successful in this course, and get something out of it, you have to be rather active both during class meetings but also outside of class. Before many classes you have to submit so-called "warm-ups" electronically. The classes themselves have a high student participation component. After classes you are expected to read the corresponding chapters of the text. Some chapters you have to read before the topics contained are discussed in class. This model is called the "flipped classroom". There is also homework. Contact me as soon as problems occur.

If you miss a class, you are expected to find out (by contacting me, for instance) which material was covered and which announcements were made during class. Please don't leave during class. Please focus on the material during class and don't do anything else. Computers are banned for most of the parts of the class, cellphones are banned for all parts.

Calculator Policy: You are encouraged to use any type of calculator on homework assignments and projects. Simple calculators are also allowed in quizzes, and tests, but more sophisticated calculators may be banned in certain quizzes and parts of tests.

XI. ACADEMIC INTEGRITY: STATEMENT ON CHEATING AND PLAGIARISM

A student whose actions are deemed by the University to be out of sympathy with the ideals, objectives or the spirit of good conduct as fostered by the University and Swiss community, may be placed on Disciplinary Probation or become subject to dismissal from the University. Cheating is a dishonest action out of sympathy with the ideals, objectives and spirit of the University. Furthermore, cheating reflects negatively on one's personal integrity and is unjust to those students who have studied.
See the Academic Catalog for full statement (page 199):
https://www.fus.edu/files/FUS-academic-catalog-2018-2020.pdf
In particular, all work submitted must be your own work, and in tests you are not allowed to use notes, cell phones, talk with other students, or copy their work. In

case of a violation you will get 0 points for the assignment and be reported to the Dean of Academic Affairs. In particular, all work submitted must be your own work, and in tests you are not allowed to use notes, cell phones, talk with other students, or copy their work. In case of a violation you will get 0 points for the assignment and be reported to the Dean of Academic Affairs.

XII. RESOURCES AVAILABLE

If you have questions, I am the first person to contact. You can come during office hours but also send me an email if these hours don't work for you. Then we can find another time. The Writing and Learning Center (WLC) also offers help in Mathematics and for the writing part of the project.

XIII. TENTATIVE COURSE SCHEDULE

Week 1: Syllabus, Ch 1: Introduction // Ch 2: Simultaneous Games,
Week 2: Ch 2: Simultaneous Games // Ch 3: Selecting Class,
Week 3; Ch 4: Doctor Location Games // Computer Lab: Ch 6: Using Excel I,
Week 4: Three or Four Pubs // Ch 7: Election I,
Week 5: Midterm 1 // Ch 8: Sequential Games I,
Week 6: Ch 11: Sequential Doctor Location // Ch 12: Probability,
Week 7: Chapter 16: Sequential Games with Randomness // Ch 17: Sequential Quiz Show I,
Two weeks of Academic Travel
Week 8: Chapter 18: Las Vegas 1962s // Chapter 22: Extensive Form of General Games,
Week 9: Chapter 23: Shubik Auction II // Midterm 2
Week 10: Chapter 24: Normal Form and Strategies // Chapter 25: VNM Poker and Kuhn Poker, //
Week 11: Ch 27: Mixed Strategies // Chapter 30: Election II,
Week 12: No class on Monday // Chapter 35: Sequential Quiy Show II
Week 13 Open Business // Review

Final: Thursday May 9, 13:30-15:30