MKT3513 Game Theory & Strategic Analysis

Lecturer: Dr. Lim Wei Shi (weishi@nus.edu.sg)
Associate Professor
Office: Mochtar Riady Building, 8-13

Session: Semester II, 2010/2011

COURSE OBJECTIVES:

This course is an introduction to game theory and its applications in the realm of business. It aims to provide an overview of non-cooperative games through the analysis of strategic interactions in conflict situations such as bargaining, market competition to name a few. Recurring themes include threatening and bluffing, punishing and rewarding, building reputations, and sustaining cooperation in non-cooperative environments through repeated interactions.

Prerequisites: A vivid imagination and an analytical mind are essential prerequisites for this course.

REFERENCES

The basic textbook used in this course is:


Occasionally, we will also refer to

Gibbons, Robert (1992) A Primer in Game Theory, Harvester Wheatsheaf. (HB144Gib)
Besanko, Dranove & Shanley (1996), Economics of Strategy, John Wiley & Sons, Inc. (HB30.28 Eco)

Other references include

McMillam, J (1992) Games, Strategies and Managers, Oxford University Press. (HD30.26Mcm)
Rasmusen, E (1994) Games and Information, Cambridge University Press. (QA269Ras)
ASSESSMENT METHODS

Case Analysis - 20% (10% + 10%)
Class Participation - 10%
Group Project - 30%
Quizzes - 40% (2 x 20%)

CASE ANALYSIS (10% + 10%): Students have to do a case analysis on a group basis. The case analysis constitutes 10% of the total assessment. The deadline of the written report (to be submitted by the group responsible and is restricted to no more than FIVE pages) is the Thursday before the class by 1700 hours. The group will upload it onto the workbin at IVLE. Each group should also prepare to do a presentation on the case that they are responsible for.

Each group is also required to submit questions regarding the case analyses/reports done by other groups latest by Monday 0900 hours. These questions are also to be uploaded onto the workbin at IVLE. All these questions constitute another 10% of the total assessment.

CLASS PARTICIPATION (10%): This course will be taught in a seminar format, with interaction and discussion among the students. Participation marks will be given based on each student’s contribution in class. Specifically, students are expected to be committed to the “4 Ps” of the student involvement in case discussions – Preparation, Presence, Promptness, Participation. Students in this course are expected to accept and maintain ownership of the case discussions.

QUIZZES (2 x 20%): Two 90 minutes quizzes are scheduled on Week 7 (28 February 2011) and Week 11 (28 March 20110) respectively. They constitute a total of 40% of the overall assessment. The quizzes are of the open-book format.

GROUP PROJECT (30%): Students participate in groups to actually model and analyze a game-theoretic situation, and write the results in a collaborative paper. Each group will present its paper at the end of the course. The project will be graded based on the criteria of (1) originality of topic, (2) the analysis, (3) clarity of writing and (4) the presentation of the project. A one-paragraph proposal of the project topic is to be submitted by Week 9, 18 March 2011, 1700 hours. The deadline for the actual project report (of up to 10 pages) is by the middle of Week 11, 1 April 2011, 1700 hours. Attendance for group project presentations is compulsory for every participant in the class.

All submissions must adhere strictly to the deadline. Marks for any submissions made after the deadline will be discounted based on a daily discount rate of 10%.

Below is a detailed description of the course syllabus. However, expect it to be adjusted now and then depending on the progress of the classes.
DETAILED COURSE SYLLABUS

Week 1 (10 January 2011) (Introduction to Game Theory)

Readings:
- Dutta, Strategies and Games, Chapter 1 – Introduction: A first look at the applications
- Dixit & Nalebuff, Thinking Strategically, Chapter 1 – Ten tales of strategy
- McMillan, Games, Strategies & Managers, Chapter 1 – The art and science of strategy
- Nalebuff & Brandenburger, Co-opetition, Chapter 1 – War and peace, and Chapter 3 – Game Theory

Weeks 2 & 3 (17 and 24 January 2011) (Nash Equilibrium and Mixed Strategies)

Readings:
- Dutta, Strategies and Games, Chapters 3, 4, 5, 8
- Dixit & Skeath, Games of Strategy, Chapter 2
- Case Study – The Strategic Form of Art Auctions, Dutta (Strategies & Games), Page 40
- Case Study – Electing the United Nations Secretary General, Dutta (Strategies & Games), Page 54

Exercise 1: Static Games of Complete Information

Week 4 (31 January 2011) (The Cournot Game)

Readings:
- Dutta, Strategies and Games, Chapter 7
- Dixit & Nalebuff, Thinking Strategically, Chapter 7 - Unpredictability
- Rasmusen, Games & Information, Chapter 1
- Gibbons, A Primer in Game Theory, Chapter 1
- Case Study – Random Drug Testing, Dutta (Strategies & Games), Page 114

Case Analysis 1: Hold or Fold? The War of Attrition

Week 5 (7 February 2011) (Dynamic Games)

Readings:
- Dutta, Strategies and Games, Chapter 11

Exercise 2: Dynamic Games of Complete Information I

Recess Week: 19 – 27 February 2011

Week 6 (14 February 2011) (Stackelberg Game, Finitely Repeated Games, Infinitely Repeated Games & The Folk Theorem)

Readings:
- Dutta, Strategies and Games, Chapters 14, 15
- Gibbons, A Primer in Game Theory, Page 85-115

Case Analysis 2: Judo Economics
Week 7 (28 February 2011)
Quiz I (90 minutes)

Video: Judo Strategy (David Yoffie, Harvard Business School) 52 minutes

Week 8 (7 March 2011) (Signaling Games)

Readings:
- Dutta, *Strategies and Games*, Chapter 24

Case Analysis 3: Product Proliferation and Preemption

Week 9 (14 March 2011) (The Lemons Problem)

Readings:

Case Analysis 4: Philips’ Compact Disk Introduction

Exercise 3: Dynamic Games of Complete Information II

Submission of 1-page Group Project Write-up by 18 March 2011, 1700 hours

Week 10 (21 March 2011) (Bargaining)

Readings:

Week 11 (28 March 2011)
Quiz II (90 minutes)

Video: The Stanford Video Guide to Negotiating

Submission of Group Project Latest By 1 April 2011, 1700 hours VIA EMAIL

Weeks 12 & 13 (4 & 11 April 2011) (Presentation of Group Project and Discussion)

Attendance in these presentation sessions will contribute to class participation.
<table>
<thead>
<tr>
<th>Week No.</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment/Class Activity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 January 2011</td>
<td>Introduction to Game Theory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17 January 2011</td>
<td>Nash Equilibrium</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>24 January 2011</td>
<td>Mixed Strategies</td>
<td>Exercise 1: Static Games of Complete Information</td>
<td>All</td>
</tr>
<tr>
<td>4</td>
<td>31 January 2011</td>
<td>The Cournot Game</td>
<td>Case Analysis 1: Hold or Fold: The War of Attrition</td>
<td>Groups 1 &amp; 2 Other groups are to submit questions regarding the case</td>
</tr>
<tr>
<td>5</td>
<td>7 February 2011</td>
<td>Dynamic Games</td>
<td>Exercise 2: Dynamic Games of Complete Information I</td>
<td>All</td>
</tr>
<tr>
<td>6</td>
<td>14 February 2011</td>
<td>The Stackelberg Game, Finitely Repeated Games, Infinitely Repeated Games &amp; The Folk Theorem</td>
<td>Case Analysis 2: Judo Economics</td>
<td>Groups 3 &amp; 4 Other groups are to submit questions regarding the case</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recess Week 19 – 27 February 2011</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>28 February 2011</td>
<td>Quiz I (90 minutes)</td>
<td>Video 1: Judo Strategy</td>
<td>Groups 5 &amp; 6 Other groups are to submit questions regarding the case</td>
</tr>
<tr>
<td>8</td>
<td>7 March 2011</td>
<td>Signaling Games</td>
<td>Case Analysis 3: Product Proliferation and Preemption</td>
<td>All</td>
</tr>
<tr>
<td>9</td>
<td>14 March 2011</td>
<td>The Lemons Problem</td>
<td>Exercise 3: Dynamic Games of Complete Information II</td>
<td>Groups 7 &amp; 8 Other groups are to submit questions regarding the case</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Case Analysis 4: Philips’ Compact Disk Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Submission of Group Project 1.Page Write-up (18 March 2011)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>21 March 2011</td>
<td>Bargaining</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>28 March 2011</td>
<td>Quiz II (90 minutes)</td>
<td>Video 2: The Stanford Guide to Negotiating</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Submission of Group Project (1 April 2011)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>4 April 2011</td>
<td>Presentation of Group Project &amp; Discussion (Groups 1 to 4)</td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>13</td>
<td>11 April 2011</td>
<td>Presentation of Group Project &amp; Discussion (Groups 5 to 8)</td>
<td></td>
<td>All</td>
</tr>
</tbody>
</table>