NATIONAL UNIVERSITY OF SINGAPORE
NUS Business School
Department of Marketing

MKT3513: Game Theory & Strategic Analysis

LECTURER: Dr. Lim Wei Shi (weishi@nus.edu.sg)
Associate Professor

OFFICE: 8-13

SESSION: Term II 2000/2010

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**

<table>
<thead>
<tr>
<th>Case Analysis</th>
<th>-</th>
<th>20% (10% + 10%)</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>-</td>
<td>10%</td>
</tr>
<tr>
<td>Group Project</td>
<td>-</td>
<td>30%</td>
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<tr>
<td>Quizzes</td>
<td>-</td>
<td>40% (2 X 20%)</td>
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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.

QUZZES (2 X 20%): Two 90 minutes quizzes are scheduled on **Week 7 (1 March 2010)** and **Week 11 (29 March 2010)** 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, 19 March 2010 1700 hours. The deadline for the actual project report (of up to 10 pages) is by the middle of Week 11, 2 April 2010 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 (11 January 2010) (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 & Branderburger, *Co-opetition*, Chapter 1 – War and peace, and Chapter 3 – Game Theory


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 (1 February January 2010) (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 (8 February 2010) (Dynamic Games)

Readings:

- Dutta, Strategies and Games, Chapter 11

Exercise 2: Dynamic Games of Complete Information I

Recess Week: 13 February 2010 – 21 March 2010

Week 6 (22 February 2010) (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 (1 March 2010)

Quiz I (90 minutes)

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

Week 8 (8 March 2010) (Signaling Games)

Readings:

- Dutta, Strategies and Games, Chapter 24

Case Analysis 3: Product Proliferation and Preemption

Week 9 (15 March 2010) (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 19 March 2010 1700 hours
Week 10 (22 March 2010) (Bargaining)

Readings:

Week 11 (29 March 2010)

Quiz II (90 minutes)

Video: The Stanford Video Guide to Negotiating

Submission of Group Project Latest By 2 April 2010 1700 hours VIA EMAIL

Weeks 12 & 13 (5 & 12 April 2010) (Presentation of Group Project and Discussion)

Attendance in these presentation sessions will contribute to class participation.

20 November 2009
<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>11 January 2010</td>
<td>Introduction to Game Theory</td>
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<td>All</td>
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<tr>
<td>2</td>
<td>18 January 2010</td>
<td>Nash Equilibrium</td>
<td>Exercise 1: Static Games of Complete Information</td>
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<td>3</td>
<td>25 January 2010</td>
<td>Mixed Strategies</td>
<td>Exercise 1: Static Games of Complete Information</td>
<td>All</td>
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<td>4</td>
<td>1 February 2010</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>
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<td>5</td>
<td>8 February 2010</td>
<td>Dynamic Games</td>
<td>Exercise 2: Dynamic Games of Complete Information I</td>
<td>All</td>
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**Recess Week 13 February 2010 – 21 February 2010**

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<th>Remarks</th>
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<tr>
<td>6</td>
<td>22 February 2010</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>
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<td>7</td>
<td>1 March 2010</td>
<td>Quiz I (90 minutes)</td>
<td>Video 1: Judo Strategy</td>
<td>All</td>
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<td>8</td>
<td>8 March 2010</td>
<td>Signaling Games</td>
<td>Case Analysis 3: Product Proliferation and Preemption</td>
<td>Groups 5 &amp; 6 Other groups are to submit questions regarding the case</td>
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<tr>
<td>9</td>
<td>15 March 2010</td>
<td>The Lemons Problem</td>
<td>Exercise 3: Dynamic Games of Complete Information II</td>
<td>All</td>
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<td>Case Analysis 4: Philips’ Compact Disk Introduction</td>
<td>Groups 7 &amp; 8 Other groups are to submit questions regarding the case</td>
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<td>Submission of Group Project 1-Page Write-up (19 March 2010)</td>
<td>All</td>
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<td>10</td>
<td>22 March 2010</td>
<td>Bargaining</td>
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<td>All</td>
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<tr>
<td>11</td>
<td>29 March 2010</td>
<td>Quiz II (90 minutes)</td>
<td>Video 2: The Stanford Guide to Negotiating</td>
<td>All</td>
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<td>12</td>
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<td>Submission of Group Project (2 April 2010)</td>
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<td>13</td>
<td>12 April 2010</td>
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