Advanced Microeconomic Policy Analysis II
API-110
Course Syllabus

Faculty: Jie Bai
O: Rubenstein 332
T: (617) 495 3805
E: jie_bai@hks.harvard.edu

Faculty Assistant: Anthony Elias
O: Rubenstein 311-E
T: (617) 495 7479
E: anthony_elias@hks.harvard.edu

Office Hours: Monday’s, 4:15 PM – 6:15 PM
You can sign up for office hours online at https://my.timetrade.com/book/71DPL. Students are encouraged to sign up either in small groups or alone. If you are unable to attend office hours or they are full, please contact Anthony for a different time.

Teaching Fellow: Elizabeth Spink
Espink@g.harvard.edu
Office Hours: Tuesday’s, 4:00-6:00 PM (L-380)

Course Assistants:
Nadia Ali
nadia_ali@hks.harvard.edu
Office Hours: Monday’s, 5:00-7:00 PM (L-330, Herzog)

Taro Kimura
taro_kimura@hks18.harvard.edu
Office Hours: Monday’s 6:00-8:00 PM (L-330, Herzog)

Mariana Rodriguez
mariana_oseguera_rodriguez@hks18.harvard.edu
Office Hours: Tuesday’s, 6:00-8:00 PM (OFR 312)

Course Description: API-110 is the second half of the two-semester sequence in advanced microeconomic analysis for MPA/ID students. The aim of this course is to further equip students with tools of modern microeconomic theory helpful in analyzing issues in international development. Topics covered will include game theory, information economics, contract theory, and touch on experimental/behavioral economics.

Audience: The course is intended for first-year MPA/ID students. Students not in the MPA/ID program will be admitted only with the permission of the instructor and only under exceptional circumstances.

Class Meetings and Review Sessions:
The course meets twice per week for lecture:
• Monday and Wednesday, 11:45 AM – 1:00 PM
• Room: L-140

There will be two review sessions (students only need to attend one) offered on Fridays by the Teaching Fellow:
• Review Section 1: Friday 1:15 PM – 2:30 PM in L-130
• Review Section 2: Friday 2:45 PM – 4:00 PM in L-130

In addition, course assistants will hold weekly office hours to help with the homework and basic conceptual questions. Students are encouraged to consult the Teaching Fellow and me for more advanced questions.
Note the following exceptions:

Class time change: On Feb 21st, the class will meet at 10:15-11:30 AM in the usual location.

Session time change: There will be a combined review session on Feb 23rd (2:45-4:00 PM in Land Hall).

Prerequisites: API-109 or its equivalent. For equivalent courses, the same pre-requisites as in API-109 apply.

Grading:
Grades for the course will be assigned based on:
- Problem Sets 15%
- Midterm 35%
- Final 50%

Examinations: There will be a midterm examination given in class on Wednesday, March 7th, 2018 and the final examination is scheduled for Friday, May 4th, 2018 from 2PM-5PM.

Problem Sets: There will be a total of 8 Problem sets assigned generally every week (usually on a Wednesday and due back on the Wednesday a week later). Unless you make prior arrangements with me, you must submit completed problem sets in hardcopy to the course dropbox by 10:10 am on the due-date. Do not bring assignments to lecture. Problem sets turned in after that will be considered late and will not receive any credit.

Problem sets are graded on a “check+/check/check−/no credit” basis and are primarily intended for completion. Earning a “check−” or better gives you full credit. Sloppy, half-hearted, or incomplete work is unlikely to receive credit. We will drop your lowest problem set grade in calculating your final grade. For students with borderline scores on the exams, consistent good performance on the problem sets could help to bump up a grade.

Discussion and the exchange of ideas are essential to academic work. You may work in small groups (four or fewer students) on the problem sets, but please do the write-ups individually. We do not expect to see identical answers from different students. You should ensure that any written work you submit for evaluation is the result of your work and that it reflects your own approach and understanding of the topic. If you choose to collaborate with others, please identify other group members on your write-up.

Due Dates:
- Problem Set 1: January 31st, 2018 (Wednesday)
- Problem Set 2: February 7th, 2018 (Wednesday)
- Problem Set 3: February 14th, 2018 (Wednesday)
- Problem Set 4: February 28th, 2018 (Wednesday)
- Problem Set 5: March 28th, 2018 (Wednesday)
- Problem Set 6: April 4th, 2018 (Wednesday)
- Problem Set 7: April 11th, 2018 (Wednesday)
- Problem Set 8: April 20th, 2018 (Friday, combined with DEV-102)

Readings:
In addition to the texts used in API-109 (MWG in particular), the following books are required for this course:
- The Economics of Contracts by Bernard Salanie (S), MIT Press, 1999.

The texts are available at the Harvard Coop and are placed on reserve at the HKS library. We will also assign a set of selected academic papers to read. Readings from academic journals can be accessed on the course website or through the Harvard Library. Any additional readings and supplementary notes will be posted on the Canvas.
Students may also want to consult the following optional texts placed at the HKS library reserve:

**Theory:**
- Fudenberg, Drew *Game Theory* 1991
- Kreps, David *Game Theory and Economic Modeling* 1990
- Hart, O. *Firms, Contracts and Financial Structure* 1995
- Kreps, David. *A Course in Microeconomic Theory* 1990
- Varian, H. *Microeconomic Analysis* 1992

**Application/Development:**
- Wydick, Bruce. *Games in Economic Development* 2007
- Basu, K. *Analytic Development Economics* 1998
- Bardhan, P and C. Udry. *Development Microeconomics* 1999

**Credits:**
This course draws on materials from previous API-110 course taught by Asim Khwaja and materials that I was fortunate to encounter as a student/TF at MIT and Yale and as a faculty at Harvard. I am especially grateful to Dirk Bergemann, Glen Ellison, Robert Gibbons, Bengt Holmstrom, Johannes Horner, Maciej Kotowski, Juuso Toikka, and Muhamet Yildiz.

**Spring Schedule 2018**

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mon</td>
<td>22-Jan</td>
<td>Lecture 1</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>24-Jan</td>
<td>Lecture 2</td>
</tr>
<tr>
<td></td>
<td>Fri</td>
<td>26-Jan</td>
<td>REVIEW</td>
</tr>
<tr>
<td></td>
<td>Mon</td>
<td>29-Jan</td>
<td>Lecture 3</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>31st-Jan</td>
<td>Lecture 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1st problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td>Fri</td>
<td>2-Feb</td>
<td>REVIEW</td>
</tr>
<tr>
<td></td>
<td>Mon</td>
<td>5-Feb</td>
<td>Lecture 5</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>7-Feb</td>
<td>Lecture 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2nd problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td>Fri</td>
<td>9-Feb</td>
<td>REVIEW</td>
</tr>
<tr>
<td></td>
<td>Mon</td>
<td>12-Feb</td>
<td>Lecture 7</td>
</tr>
<tr>
<td></td>
<td>Wed</td>
<td>14-Feb</td>
<td>Lecture 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3rd problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td>Fri</td>
<td>16-Feb</td>
<td>REVIEW</td>
</tr>
</tbody>
</table>

**Week 5**
- Mon | 19-Feb | President's Day 2017- NO CLASS
- Wed | 21-Feb | Lecture 9 (TIME CHANGE: 10:15-11:30 AM, L140)
- Fri | 23-Feb | REVIEW (COMBINED SESSION, 2:45-4 PM, LAND HALL)
<table>
<thead>
<tr>
<th>Week</th>
<th>Mon</th>
<th>Wed</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>26-Feb</td>
<td>28-Feb</td>
<td>4th problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td>Lecture 10</td>
<td>Lecture 11</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>5-Mar</td>
<td>7-Mar</td>
<td>Midterm Exam</td>
</tr>
<tr>
<td></td>
<td>Lecture 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No Review (Spring recess begins)</td>
</tr>
<tr>
<td>8</td>
<td>12-Mar</td>
<td>14-Mar</td>
<td>HOLIDAY: Spring Break</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>19-Mar</td>
<td>21-Mar</td>
<td>Lecture 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>26-Mar</td>
<td>28-Mar</td>
<td>Lecture 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5th problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2-Apr</td>
<td>4-Apr</td>
<td>Lecture 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6th problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>9-Apr</td>
<td>11-Apr</td>
<td>Lecture 19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7th problem set due 10:10am</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>16-Apr</td>
<td>18-Apr</td>
<td>Lecture 21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>23-Apr</td>
<td>25-Apr</td>
<td>Lecture 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4-May</td>
<td></td>
<td>Final Exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Course Outline

The course is divided into two parts. The first part (Lecture 1-16) covers game theory, and the second part (Lecture 17-24) introduces contract theory. Students are highly encouraged to read the textbook chapters and readings before or after each class. Sometimes we will focus on particular sections of the journal articles; students will be notified in such cases. Other listed readings are optional and are intended for students who are interested in delving deeper into a particular topic.

The course seeks to give students an overview of important topics in game theory and contract theory. However, some topics may not be covered in the depth that they ought to be. The following lectures touch on topics that are more advanced and/or may be of particular interest to some students (they may be skipped if time doesn’t allow). Materials covered in these lectures would not be tested.

- Lecture 11: Behavioral game theory; learning and evolutionary foundations
- Lecture 16: Reputation

Note: The list of topics and the pace are subject to change. Students will be notified in advance if that happens.

I. Game Theory

Lecture 1:
- Introduction, Formal Description of Games
  \((MWG\ 7.A-B)\)
- Playing Games


I.A. Static Games of Complete Information

Lecture 2-3:
- Normal Form Representation
  \((G\ 1.1.A)\)
- Dominant Strategies, Iterated Elimination
  \((G\ 1.1.B,\ MWG\ 8.B)\)
- Nash Equilibrium
  \((G\ 1.1.C,\ Appendix\ 1.1.C,\ MWG\ 8.D)\)

Lecture 4:
Applications of NE:
- Cournot Competition
  \((G\ 1.2.A,\ MWG\ 12.C)\)
- Bertrand Competition
  \((G\ 1.2.B,\ MWG\ 12.C)\)
- Tragedy of the Commons
  \((G\ 1.2.D)\)


Lecture 5:
- Mixed Strategies
  \((G\ 1.3.A)\)
Lecture 6:
Recap and Further Applications:
• Corruption and Norms
• Development Traps and Coordination Games


I.B. Dynamic Games of Complete Information

Lecture 7-8:
• Perfect Information Games, Backward Induction (G 2.1.A)
• Extensive & Normal Form Representation (G 2.4.A, MWG 7.C-D)
• Subgame Perfect Nash Equilibrium (SPNE) (G 2.2 A, G 2.4.B, MWG 9.A-B)
• Application: Stackelberg Competition (G 2.1.B)
• Application: Bank Runs (G 2.2.B)


Lecture 9-10:
• Repeated Games (G 2.3.A, MWG 12.D)
• Infinitely Repeated Games, SDP, Folk Theorem (G 2.3.B&Appendix, MWG 12.Appendix A)
• Application: Implicit Cartels (G 2.3 C)


Lecture 11:
• A Brief Introduction to Experimental/Behavioral Game Theory
• Learning and Evolutionary Foundations


Lecture 12:
• Mid-term Review

Midterm (in class) – March 7th (Wednesday)

I.C. Games of Incomplete Information & Information Economics

Lecture 13:
• Introduction to Information Economics  
  \textit{(S 1, MWG 13.A)}
• Akerlof’s Lemon Model, Signals of Quality  
  \textit{(MWG 13.B)}


Lecture 14
• Signaling Games  
  \textit{(G 4.2.A)}
• Perfect Bayesian Equilibrium  
  \textit{(G 4.1, MWG 9.C)}

Lecture 15:
• Job Market Signaling  
  \textit{(G4.2.B, S 4.2, MWG 13.C)}


Lecture 16:
• Trust and Reputation  
  \textit{(G 4.3.C)}
• Application: Media Bias


II. Contract Theory

II.A. Adverse Selection and Self-Selection Contracts

Lecture 17:
- Principal-Agent framework *(S 1, MWG 13.A, 14.A)*
- Adverse Selection *(S 2.1-2.2)*
- Screening, Monopolistic Pricing *(MWG 14.C)*


Lecture 18:
- Application: A Model of Red-Tape


II.B. Moral Hazard and Incentive Contracts

Lecture 19:
- Moral Hazard *(S 5.1-2, MWG 14.B)*

Lecture 20:
- Application: Share-cropping


II.C. Incomplete Contracts

Lectures 21:
- Incomplete Contracts *(S 7.1)*
- Application: Scope of Government *(S 6.1, 6.4.5, 6.5 conclusion only)*


Lecture 22:
• Boundaries Between Firms and Markets  
  (S 7.2)
• Property Rights


Lecture 23:
• Final Review

Lecture 24: Applications to Development (Combined with DEV-102)
• Student Topics