Faculty:
Jie Bai
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Phone: +1 (617) 495-3805
Email: jie_bai@hks.harvard.edu

Faculty Assistant:
Lisa MacPhee
Office: Belfer 125
Phone: +1 (617) 495-1148
Email: lisa_macphee@hks.harvard.edu

Office Hours:
TBD (see Canvas for most updated details)

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 Jie for a different time.

Teaching Fellow:
Shreya Dubey
Office Hours: TBD (see Canvas for most updated details)

Course Assistants:
Phil Salazar
Office Hours: TBD (see Canvas for most updated details)

Prashansa Srivastava
Office Hours: TBD (see Canvas for most updated details)

Harry Wang
Office Hours: TBD (see Canvas for most updated details)

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 instructors and only under exceptional circumstances.

Instructor:
This course is taught by Professor Jie Bai.
Class Meetings and Review Sessions:
The course meets twice per week for lecture:
- Tuesday and Thursday, 10:30a – 11:45a ET
- Location: L140

There will also be a weekly review session offered by the Teaching Fellow; these sessions are identical:
- Friday, 01:30p – 02:45p ET or 3:00p – 4:15p ET, both in W436.

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 the instructors for more advanced questions.

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 20%
- Midterm 30%
- Final 50%

Examinations:
There will be a midterm examination on Thursday, March 7 during class time and the final examination is scheduled for Monday, May 6th from 09:00a – 12:00p.

Problem Sets:
There will be a total of 8 Problem sets assigned generally every week (usually on a Thursday and due back on the Thursday a week later). Unless you make prior arrangements with the instructor, you must submit completed problem sets to Canvas prior to 10:00am on the due date. You can either upload pdfs of typed solutions or pictures of handwritten solutions. 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.

Problem Set Due Dates:
- Problem Set 1: Thursday, February 1st
- Problem Set 2: Thursday, February 8th
- Problem Set 3: Thursday, February 22nd
- Problem Set 4: Thursday, February 29th
- Problem Set 5: Thursday, March 28th
- Problem Set 6: Thursday, April 4th
- Problem Set 7: Thursday, April 18th
- Problem Set 8: Thursday, April 25th
Readings:
In addition to the texts used in API-109 (MWG in particular), the following books are required for this course:


We are working with the Office of Course Materials to make the required texts available in a digital format. We will also assign a set of selected academic papers to read. Readings from academic journals can be accessed on the course website (Canvas) or through the Harvard Library. Any additional readings and supplementary notes will be posted to Canvas.

Students may also want to consult the following optional texts:

**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 Jie was fortunate to encounter at MIT, Yale and Harvard. We are especially grateful to Dirk Bergemann, Glen Ellison, Robert Gibbons, Bengt Holmstrom, Johannes Horner, Maciej Kotowski, Juuso Toikka, and Muhamet Yildiz.
### Spring Schedule 2023

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Tues</td>
<td>23-Jan</td>
<td>Lecture 1</td>
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<td>Thurs</td>
<td>25-Jan</td>
<td>Lecture 2</td>
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<tr>
<td>Week 2</td>
<td>Tues</td>
<td>30-Jan</td>
<td>Lecture 3</td>
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<td>Thurs</td>
<td>01-Feb</td>
<td>Lecture 4</td>
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<td>Problem Set 1 due @ 10:00 AM ET</td>
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<td>Week 3</td>
<td>Tues</td>
<td>06-Feb</td>
<td>Lecture 5</td>
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<td>Thurs</td>
<td>08-Feb</td>
<td>Lecture 6</td>
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<td>Problem Set 2 due @ 10:00 AM ET</td>
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<td>Week 4</td>
<td>Tues</td>
<td>13-Feb</td>
<td>Lecture 7</td>
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<td>Thurs</td>
<td>15-Feb</td>
<td>Lecture 8</td>
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<td>Week 5</td>
<td>Tues</td>
<td>20-Feb</td>
<td>Lecture 9</td>
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<td>Thurs</td>
<td>22-Feb</td>
<td>Lecture 10</td>
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<td>Week 6</td>
<td>Tues</td>
<td>27-Feb</td>
<td>Lecture 11</td>
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<td>Thurs</td>
<td>29-Feb</td>
<td>Lecture 12</td>
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<td>Problem Set 4 due @ 10:00 AM ET</td>
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<td>Week 7</td>
<td>Tues</td>
<td>05-Mar</td>
<td>Lecture 13</td>
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<td>Thurs</td>
<td>07-Mar</td>
<td>Midterm Exam (in class)</td>
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<td>Week 8</td>
<td>Tues</td>
<td>12-Mar</td>
<td>No class (Spring Break)</td>
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<td>Thurs</td>
<td>14-Mar</td>
<td>No class (Spring Break)</td>
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<td>Week 9</td>
<td>Tues</td>
<td>19-Mar</td>
<td>Lecture 14</td>
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<td>Thurs</td>
<td>21-Mar</td>
<td>Lecture 15</td>
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<td>Week 10</td>
<td>Tues</td>
<td>26-Mar</td>
<td>Lecture 16</td>
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<td>Thurs</td>
<td>28-Mar</td>
<td>Lecture 17</td>
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<td>Week 11</td>
<td>Tues</td>
<td>02-Apr</td>
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<td>Thurs</td>
<td>04-Apr</td>
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<td>Tues</td>
<td>09-Apr</td>
<td>Lecture 20</td>
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<td>Thurs</td>
<td>11-Apr</td>
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<td>Week 13</td>
<td>Tues</td>
<td>16-Apr</td>
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<td>Thurs</td>
<td>18-Apr</td>
<td>Lecture 23</td>
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<td>Week 14</td>
<td>Tues</td>
<td>23-Apr</td>
<td>Lecture 24</td>
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<td>Thurs</td>
<td>25-Apr</td>
<td>Lecture 25</td>
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<td>Problem Set 8 due @ 10:00 AM ET</td>
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<td>Week 16</td>
<td>Mon</td>
<td>06-May</td>
<td>Final Exam (09:00a – 12:00p ET)</td>
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Course Outline

The course is divided into two parts. The first part covers game theory, and the second part introduces contract theory. Students are highly encouraged to read the textbook chapters and starred (*) 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.

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 4-5:
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 6:
Mixed Strategies 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)
- Application: Stackleberg Competition (G 2.1.B)
- Application: Bank Runs (G 2.2.B)


Lecture 9-11:
- Repeated Games (G 2.3.A, MWG 12.D)
- Infinitely Repeated Games, Folk Theorem (G 2.3.B&Appendix, MWG 12.Appendix A)
- Applications: Implicit Cartels; Relational Contract (G 2.3.C)


Davies, E. and Fafchamps, M., 2017. When No Bad Deed Goes Punished: Relational Contracting in Ghana versus the UK (No. w23123). National Bureau of Economic Research.

Lecture 12:
- Midterm review

Lecture 13:
- A Brief Introduction to Experimental/Behavioral Game Theory


Midterm (during class time) – Thursday, March 7
I.C. Games of Incomplete Information & Information Economics

Lecture 14-15:
• Introduction to Information Economics \((S \, 1, \, MWG \, 13.A)\)
• Static Bayesian Games \((G \, 3.1.A-C; \, MWG \, 8.E)\)
• Applications of BNE: Lemons Problem \((G \, 3.2.A)\)


Lecture 16-17:
• Signaling Games \((G \, 4.2.A)\)
• Perfect Bayesian Equilibrium \((G \, 4.1, \, MWG \, 9.C)\)


Lecture 18:
• Job Market Signaling \((G4.2.B, \, S \, 4.2, \, MWG \, 13.C)\)


I.D. Adverse Selection and Self-Selection Contracts

Lecture 19-20:
• Principal-Agent framework \((S \, 1, \, MWG \, 13.A, \, 14.A)\)
• Adverse Selection \((S \, 2.1-2.2)\)
• Screening, Monopolistic Pricing \((MWG \, 14.C)\)


Lecture 21:
• Application: A Model of Red-Tape
I.E. Moral Hazard and Incentive Contracts

Lecture 22-23:
• Moral Hazard (S 5.1-2, MWG 14.B)

Lecture 24:
• Application: Sharecropping


Lecture 25:
• Final Review

Final Exam (09:00a – 12:00p ET) – Monday, May 6th