This course is intended to introduce you to various topics in social choice theory, which is a formal analysis of general preference aggregation and voting rules. The course also covers modern analysis on voting by using game theory, mechanism design, empirical analysis, and laboratory experiments.

**Course Logistics**

Office hours: Tuesday 1:30-3:30pm (Until Feb 9)/ Tuesday 1-3pm (From Feb 16).  
Office: McNeil 462  
Email: sangmok-at-sas.upenn.edu

Teaching Assistants: Weilong Zhang(weilongz@sas.upenn.edu)  
TA Office Hours: Friday 12-2pm (312 McNeil)

We will use Canvas for announcements, handouts, notes, homework assignments etc.

**Course Description**

**Prerequisites:** This class is Math intensive. You are expected to have a solid background of Mathematical reasoning, analysis, and statistics. The minimum course prerequisites include Econ 101 (Intermediate Micro Theory), Econ 103 (statistics), Math 104, and either Math 114 or Math 115 (Calculus Part I and II). Econ 212 (Game Theory) and Econ 104 (Econometrics) are highly recommended.

**Textbooks:** There is no textbook for this class. The following textbooks are only recommended. You will not be tested on material that is not covered in class.

* Out of print. Most parts of the book will be scanned and available on Canvas.  
* Available at Penn bookstore. Good source of real applications and exercises.  
* We will closely follow this book for Topic II-3 (some possibility results).

**Requirement and Grading Policy**
1. **Grades**

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<th>Due/Exam dates</th>
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<tr>
<td>Two midterm exams</td>
<td>2 x 30% March 2, April 11 (class time)</td>
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<td>Final exam</td>
<td>1 x 20% May 5 (Thursday), 9-11am</td>
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<td>Term paper</td>
<td>1 x 20% Submit with the final exam</td>
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2. **Exercises** will be assigned from time to time during class. It is in your interest to complete the exercises, even though they will not be collected or graded. You can discuss your answers during office hours. Also, there will be TA sessions about a week before each exam.

3. **Examinations** will be *in-class and closed-book*. Collaboration on the examinations is prohibited. If you miss one mid-term exam, with a compelling and verifiable reason, the final exam and the term paper will make up 40 and 30 percent of your total grade. A request for a re-grade of an exam must be submitted to me in writing with the original bluebook, in which case I will reevaluate your complete homework set or exam.

4. **Term paper** finds and studies any cases on collective choices. The paper should not exceed 10 pages with 1.5 spacing. The originality of the idea and logically tight arguments are much more valued than the length of the paper. Two progress reports will be required to submit along with mid-term exams.

One option is to evaluate a choice rule currently used in an organization. If the rule suffers from drawbacks, you may propose an alternative choice rule and justify the new rule by discussing potential outcomes. Another option is to propose new ideas for choice rules in a situation where a formal choice rule has not yet been implemented. We will discuss a few term-paper ideas during class. I encourage you to search for a topic from your personal experiences, rather than, e.g., presidential elections.

**Topics and Optional Readings**

The journal articles cited below are difficult, so do not get discouraged if you find them so.

I. **Elements of Social Choice Theory**

1. Intro: Course Introduction. Motivating examples. Some mathematical background.

2. A Special Case with Two Alternatives: Simple majority. May’s theorem, Condorcet winner: Condorcet paradox. Kelly(Chapter 1 and 2), Riker (Chapter 3, Chapter 4.B)
II. General Social Choice Theory

1. General difficulties of preference aggregation: Binary relations. Preferences. Preference aggregation rule. Arrow's Impossibility Theorem with a sketchy proof: Kelly (Chapter 6, 7), Riker (Chapter 3, Chapter 4.A, 5. A-B)


3. Possibility Results: Decision under restricted domains (single peaked preferences, voting over resource allocation, and intermediate preferences), Approval voting: Kelly (Chapter 2, Chapter 3, Chapter 12), Riker (Chapter 4.E, Chapter 5.B-C), Moulin (Chapter 4).

III. Strategic Voting

   * Most undergraduate game theory textbooks cover Nash Equilibrium in first few chapters.


IV. Voting and Information Aggregation


2. Condorcet Jury Theorem and Strategic Voting.

   Austen-Smith and Banks (1996): Information Aggregation, Rationality, and the Condorcet Jury Theorem; American Political Science Review Vol. 90(1)


V. Voting Market:
