

Social Choice Theory (Econ 4120)  
Spring 2024  
Postlewaite

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. Office hours: Friday 1:30-3:30pm and by appointment. Office: PCPSE 515. Email: apostlew@upenn.edu.

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

### Course Description

There are many situations in which a group of people must aggregate individuals' preferences to make a group choice. This class studies and critiques a variety of aggregation rules that are used and asks whether there are alternative schemes that perform better according to some criteria. The material is covered using formal models. The material does not use mathematics beyond basic calculus, but you should feel comfortable with rigorous formal models.

Textbooks: There are no required textbooks for this class, although the Gaertner book below will be useful. The textbooks may be of use for background reading. Wikipedia is often a better source than textbooks (and free). You will not be tested on material that is not covered in class.

*A Primer in Social Choice Theory*, Wulf Gaertner, Oxford, 2006; referenced below by (G).

*Welfare Economics and Social Choice Theory*, Second Edition, Allan Feldman and Roberto Serrano, Springer-Verlag, 2006. An e-book version of this book; referenced below by (FS). An electronic version of this book can be downloaded from the library on campus and off campus through PennKey authentication: <https://doi-org.proxy.library.upenn.edu/10.1007/0-387-29368-X>

*Social Choice Theory: An Introduction*, by Jerry S. Kelly, Springer-Verlag, 1988 (Out of Print); referenced below by (K).

**Grading:** Midterm exam (40%) Final exam (60%); homework and class participation may be used in marginal cases.

Exercises will be assigned from time to time during class. It is in your interest to complete the exercises. You can discuss your answers at the beginning of each class.

## **Topics**

### **I. Elements of Social Choice Theory**

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

A Special Case with Two Alternatives: Simple majority. May's theorem, Condorcet winner. Condorcet paradox.: (G) (Chapter 3), (FS) Chapter 12.

### **II. General Social Choice Theory**

1. General difficulties of preference aggregation: Binary relations. Preferences. Preference aggregation rule. Arrow's Impossibility Theorem (G) Chapter 3; (FS) Chapter 12, 13.

2. Voting rules: Majoritarian methods (Sequential majority. Copeland voting rule). Positional methods (Plurality. Approval voting. Borda score voting rule). Evaluating voting rules. Gibbard-Satterthwaite Impossibility Theorem: (K) (Chapter 5, 10), (G) Chapter 5, (FS) Chapter 14.3.

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),

### **III. Strategic Voting**

1. Background: Game Theory. Nash Equilibrium.

2. Strategic Voting: Illustration with examples. Case studies. Theoretical and Empirical Analysis.

### **IV. Voting and Information Aggregation**

1. Background: Bayes Rule. Bayesian Game. Bayesian Nash Equilibrium.

2. Condorcet Jury Theorem and Strategic Voting.

3. Comparing voting rules: Theory, Extension to Voting with Deliberation.

### **V. Voting Market:**

1. Vote Buying

### **VI Bargaining**(G) Chapter 8

1. Nash Bargaining

2. Kalai-Smorodinsky Bargaining

### **VII Public Goods** (FS) Chapter 8

### **VIII. Implementation** (FS) Chapters 14, 15.