

Graham Elliott  
UCSD, Department of Economics  
Fall Quarter 2022

## **ECONOMETRICS 220A**

### ***Course Description:***

The course is designed to be an introduction to probability theory, sampling and statistical theory to prepare students for the remainder of the econometrics sequence. The emphasis of the course is to understand the basic principles of each of these areas so that students will be able to read and understand econometrics papers and build a foundation for learning econometric theory.

### ***Books***

The text, which will be followed closely, is  
Casella, G. and R. Berger, Statistical Inference, 2<sup>nd</sup> Edition, Duxbury.  
This book covers all of the material of the course and in addition provides many problems for practice as well as excellent references.

I will also place notes for the statistical theory component of the course on Canvas. The notes are more extensive than it is possible for me to cover, I will be clear about this in class.

### ***Course Outline***

The course outline gives an estimate of the material I will cover. In addition, general reading guides are suggested from the text (CB = Casella and Berger).

#### Probability

1. Basic Theory, conditional probability. CB ch 1
2. Random Variables, Distributions, Expectations, CB ch2.-2.3.
3. Common Distributions, CB ch 3.
4. Joint, Marginal and Conditional Distributions, Independence. CB ch 4.

#### Sampling

1. Sampling and Sums of Random Variables. CB ch 5.1-5.3
2. Laws of Large Numbers and CLT, CB ch5.5.

#### Statistical Theory

1. General Introduction to the goals, Bayesian Statistics. CB ch 6 6.2.1, 6.3.1, ch7.2.3
2. Point Estimation, CB ch7, Ch 10.1
3. Hypothesis tests, Neyman Pearson lemma, Likelihood Ratio and related tests  
CB ch 8., ch10.3.
4. Interval estimation, CB ch 9.
5. Decision Theory and Statistics (see notes).

### ***Grading***

I will hand out problem sets that will not be graded, solutions will be handed out. There will be a midterm exam (26 October in class) and a final exam in exam week (each worth 50%).

### ***Office Hours***

We will work out first class when we know our schedules.

***Teaching Assistant:*** Haitian Xie.

### ***Miscellaneous***

Currently this class is scheduled as in person. If we move to zoom or have any zoom meetings, no recordings may be shared outside the class or published elsewhere.