STATISTICS 40991 SYLLABUS
Fall 2025

Ph.D. Program in Social and Political Sciences
Bocconi University

Instructor	Bernard "Chip" Cole, PhD
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Office Hours	To be announced, or by appointment. Location to be announced
Description	This course further discusses the fundamental concepts of statistical inference and modeling, with the aid of computer simulations (using the R program) throughout the course to understand deeply and apply the statistical concepts. The course is compulsory for the PhD program in *Social and Political Sciences*. Interested students from other PhD programs may also enroll.
Recommend text	Pruim, R.J. (2018). *Foundations and Applications of Statistics: An Introduction Using R* (second edition). American Mathematical Society. Providence, RI. USA.
	This book is optional—you do not need to purchase it. Class notes will be made available after the lectures. These notes, combined with your own, will ordinarily be sufficient for successful completion of course. The text is recommended for learners who might benefit from having another resource available.
Meeting times	Monday, Wednesday, Friday 10:15–11:44 a.m.
	3 October to 31 October
Classroom	To be announced
Assignments	There will be one assignment due prior to the final exam—due date to be announced
Examinations	There will be one final exam—date to be announced
Website	To be announced
Software	R available at https://www.r-project.org/. R is free-of-charge, open-source software. You might also wish to install the R Studio, which provides an easy-to-use interface (https://posit.co/download/rstudio-desktop/)

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Class Schedule

Week starting	Topic(s)	Reading (text sections)
29/9	Introduction to the statistical software environment R and to the use of computer simulations for the illustration of properties of procedures	
6/10	Principles of frequentist statistical inference: sampling distributions (in theory, simulations, and practice). Experimenting with convergence in probability and in distribution	
13/10	Properties of point estimators, confidence intervals, tests of hypotheses. The (simple) linear model: illustration of the joint distribution of parameter estimators	
20/10	Review of the multiple linear model with matrix algebra: testing nested models, and statistical inference.	
27/10	General statistical models: Maximum Likelihood estimation and statistical inference	

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Schedule of Assignments

Assignment number	Due date
1	9/12
2	9/19
3	9/26
4	10/17
5	10/24
6	10/31
7	11/28
8	12/5

Schedule of Exams

Exam	Date
First midterm	Friday, October 7 in class
Second midterm	Friday, November 11 in class
Final	Monday, December 12 10:30 AM to 12:30 PM in Votey 205

Course Policies

Academic Integrity
We will adhere strictly to the University Code of Academic Integrity, which can be found at www.uvm.edu/policies/student/acadintegrity.pdf.

Religious Holidays
Students have the right to practice the religion of their choice. Each semester students should submit in writing to the instructor by the end of the second full week of classes their documented religious holiday schedule for the semester. An arrangement can then be made to make up the missed work.

Accommodations for Students with Disabilities
In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Disability Services on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. A student's accommodation letter lists those accommodations that will not be implemented until the student meets with their faculty to create a plan. Contact SAS: A170 Living/Learning Center; 802-656-7753; access@uvm.edu; or https://www.uvm.edu/academicsuccess/student_accessibility_services

Course Evaluations
Students are expected to complete an anonymous, confidential evaluation form at the conclusion of the course. The information gained will be used to improve the course. Constructive comments and suggestions are especially appreciated.

Intellectual Property Statement/Prohibition on Sharing Academic Materials:
Students are prohibited from publicly sharing or selling academic materials that they did not author (e.g., syllabus, assignments, lecture notes, assignment solutions). Violations will be handled under UVM's Intellectual Property policy and Code of Academic Integrity.