

ECON 6100
Introduction to Bayesian Statistics
SPRING 2026 SYLLABUS

CLASS INFORMATION

Time: T 6:00pm–9:15pm

Location: Davis-Shaughnessy Hall 274

Office Hours: TR 3:00pm–4:00pm

Web: github.com/econdojo/stat

INSTRUCTOR CONTACT

Instructor: Fei Tan

Office: Davis-Shaughnessy Hall 469A

Primary: discord.gg/SsrNPEeP2P

Secondary: tanf@slu.edu

GENERAL INFORMATION

COURSE DESCRIPTION

This course provides a detailed coverage of Bayesian inferential methods and their applications to a variety of problems drawn from economics and business. Starting with basic concepts of probability and inference, the treatment covers prior and posterior distributions, classical and MCMC simulation methods, regressions for univariate and multivariate outcomes, and computation of the marginal likelihood and model choice. To optimize learning outcomes, this course incorporates artificial intelligence to help students develop hands-on Bayesian and Python skills required to conduct data analysis useful for economic and financial decision making. These AI tools provide personalized learning, real-time feedback, and practical application support. Finally, the course will help prepare students entering doctoral education or starting careers in economics, finance, marketing, operations, accounting, political science, statistics, and biostatistics.

PREREQUISITES

Although the lectures will be self-contained, student are assumed to have completed ECON 4770 (Advanced Econometrics) or an equivalent undergraduate course in statistics and econometrics. Students are also expected to be familiar with basic operations in Python, an interpreted high-level general-purpose programming language.

TEXTBOOKS

- **Required:** *Introduction to Bayesian Econometrics*, 2nd Edition, by Edward Greenberg.
- **Optional:** *Contemporary Bayesian Econometrics and Statistics*, by John Geweke.

GRADING POLICY

PROBLEM SETS

There will be three required problem sets. Late submission is not graded and will be nullified. Each problem set is worth 20 points of the course grade; it will be submitted and evaluated on an individual basis. To prepare a submission, please use [Visual Studio Code](#) for both \LaTeX typesetting and Python programming, and upload all source files onto [GitHub Classroom](#).

RESEARCH PROJECT

The project consists of a 10–15 pages term paper that makes judicious use of the statistical tools covered in this course to study an empirical topic of your interest. The project accounts for 40 points of the course grade; it will be conducted in teams of 2 to 4 members and evaluated based on collective endeavor. Please follow the same submission requirement as the problem sets.

GRADING SCALE

There is no grading curve used other than the scale below. However, the instructor reserves the right to adjust the grading scale based on overall class performance at the end of the semester.

	Max Points	Grade	Points
Problem Set 1	20	A	92–100
Problem Set 2	20	A-	88–92
Problem Set 3	20	B+	84–88
Research Project	<u>40</u>	B	80–84
Total	100	B-	76–80
		C+	72–76
		C	68–72
		C-	64–68
		D	60–64
		F	0–60

COURSE OUTLINE

Below is a tentative outline; the instructor reserves the right to change it whenever needed. My goal is to proceed at an optimal pace: slow enough that important concepts are thoroughly learned, yet fast enough that the course does not drag. It is a delicate balance.

Part I	Introduction
	Getting Started with AI Agents
	Lecture 0: Basic Concepts of Probability and Inference
	Lecture 1: Posterior Distributions and Inference
	Lecture 2: Prior Distributions
Part II	Simulation
	Lecture 3: Classical Simulation
	Lecture 4: Basics of Markov Chains
	Lecture 5: Simulation by MCMC Methods
Part III	Applications
	Lecture 6: Linear Regression and Extensions
	Lecture 7: Multivariate Responses
	Lecture 8: Time Series
	Lecture 9: Bayesian DSGE Models

MISCELLANEOUS INFORMATION

1. **Academic Integrity.** Academic integrity is the commitment to and demonstration of honest and moral behavior in an academic setting. Since the mission of the University is “the pursuit of truth for the greater glory of God and for the service of humanity,” acts of integrity are essential to its very reason for existence. Thus, the University regards academic integrity as a matter of serious importance. Academic integrity is the foundation of the academic assessment process, which in turn sustains the ability of the University to certify to the outside world the skills and attainments of its graduates. Adhering to the standards of academic integrity allows all members of the University to contribute to a just and equitable learning environment that cultivates moral character and self-respect. The full University-level Academic Integrity Policy can be found on the Provost’s Office website at: www.slu.edu/provost/policies/academic-and-course/academic-integrity-policy.pdf.

2. **Disability Accommodations.** Students with a documented disability who wish to request academic accommodations must formally register their disability with the University. Once successfully registered, students also must notify their course instructor that they wish to use their approved accommodations in the course.

Please contact the Center for Accessibility and Disability Resources (CADR) to schedule an appointment to discuss accommodation requests and eligibility requirements. Most students on the St. Louis campus will contact CADR, located in the Student Success Center and available by email at accessibility.disability@slu.edu or by phone at 314.977.3484. Once approved, information about a student's eligibility for academic accommodations will be shared with course instructors by email from CADR and within Banner. Students who do not have a documented disability but who think they may have one also are encouraged to contact CADR. Confidentiality will be observed in all inquiries.

3. **Title IX.** Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of discrimination on the basis of sex, including sexual harassment, sexual assault, stalking, domestic or dating violence, we encourage you to report this to the University. If you speak with a faculty member about an incident that involves a Title IX matter, that faculty member must notify SLU's Title IX Coordinator that you shared an experience relating to Title IX. This is true even if you ask the faculty member not to disclose the incident. The Title IX Coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you are pregnant or experiencing a pregnancy related condition, the Title IX Coordinator can assist you in understanding your rights and options as well as provide supportive measures.

Anna Kratky is the Title IX Coordinator at Saint Louis University (DuBourg Hall, room 36; anna.kratky@slu.edu; 314-977-3886). If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK or make an anonymous report through SLU's Integrity Hotline by calling 1-877-525-5669 or online at SLU.EDU/INTEGRITYHOTLINE. To view SLU's policies, and for resources, please visit the following web addresses: www.slu.edu/about/safety/sexual-assault-resources/index.php.