

ISE369/POL369

Introduction to Political Informatics

Course Information

Semester:	Spring 2026
Time:	TuTh, 12:30PM-1:50PM
Location:	CS2120

Contact Information

Instructor:	Robert Kelly
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Content

Recent advances in the availability of large data sets, analytic methods, and technology tools have impacted the foundations of democratic society, specifically the ability of elections to provide representation for the underlying population. This course presents the data analysis aspects of these advances. Topics covered include approaches to election data capture, election result data sets, gerrymandering, redistricting, micro-targeting, voter surveys, election security, election district geometry, impact of social media, measures of political quality, and the prediction of election results.

This course is offered as both ISE 369 and POL 369. Successful completion of CSE 101 or CSE114 or IAE101 is required to enroll in this course. Successful completion of one of the following courses is also required to enroll in this course: AMS102, AMS110, AMS310, or POL201. POL102 is an advisory prerequisite of the course. Students enrolling in this course who have not completed POL102 should expect to work harder and possibly not do as well as students who have completed POL102.

Course Objectives

The expected outcomes of the course are:

- Students will understand the legal and legislative requirements for fair elections.
- Students will understand the semantics and processing of datasets used for political analysis and apply that understanding to the processing of actual election data.
- Students will combine multiple data sets to analyze the racial and political fairness of election results.

SBC: TECH; SBS+

This course satisfies the TECH and SBS+ objectives of the Stony Brook Curriculum.

TECH Learning Outcomes

1. Demonstrate an ability to apply technical tools and knowledge to practical systems and problem solving.
2. Design, understand, build, or analyze selected aspects of the human-made world. The “human-made world” is defined for this purpose as “artifacts of our surroundings that are conceived, designed, and/or constructed using technological tools and methods.”

These learning outcomes will be evaluated via the assignments involving the use of Python to analyze election data.

SBS+ Learning Outcome

1. Students must use the skills expected from their Versatility courses to study and practice them in greater depth, with further study applied to the area in which they are certified.

This learning outcome will be evaluated via exam.

Course Topics

The preliminary schedule of course topics is shown below, but you can expect some adjustments as the semester progresses.

Week	Topics
1	Course Orientation –syllabus review, including grade calculation, exams, quizzes, and other class policies. Introduction to Python – Python software development environment; Python language features; Use of Python libraries illustrated with access to the os library.
2	History of voting in the United States – Review of the evolution of voting in the United States. Review of the US system of elections including congressional, senatorial, and presidential elections. The presidential election discussion will include rules for party primaries, statewide variations, and the electoral college. Campaign contribution issues will be discussed, including direct contributions, PACs, and limits and disclosure of campaign funding. Students will use a web interface to a political dataset (e.g., OpenFEC) to access and analyze campaign contribution data.
3	OpenFEC dataset access – Campaign contribution data will be downloaded and analyzed with the use of Python libraries, notably pandas. Other Python libraries for the display and visualization of data will be discussed.

Week	Topics
4	Elections - Review of constraints on elections derived from US Constitution, State constitutions, 1965 Voting Rights Act, US Supreme Court decisions, and other court decisions and legislation. Recent and proposed legislation concerning elections will be covered, as will campaign finance restrictions. Historical EAVS datasets will be accessed and analyzed to determine trends in voting equipment and voting approaches (e.g., mail voting).
5	Issues in elections – current issues in federal elections will be discussed, including trends in voting access, mail ballots, drop boxes, election equipment, voter identification, voter citizenship verification, the SAVE database, maintenance of voter rolls, and the ERIC system for coordination of voter registration data. Issues including early voting, ballot design, and felony disenfranchisement will be examined with access to EAVS data.
6	Political, demographic, and geographic data sets – Description of data formats used in geographical political data sets, including Shapefiles and GeoJSON. Representation systems for geographic boundary data will be discussed, including coordinate systems. State policies for aggregation of voting data. Access to US Census data sets and levels of aggregation of census data. Students will process data sets in Python using libraries such as Fiona, Shapely, and GeoPandas. Political geo data will be subject to format conversion and display using Python libraries.
7	Redistricting– Legal requirements and restrictions in the construction of election district boundaries will be discussed, including population and court-mandated reasons for redistricting; strategies for gerrymandering will be discussed and the analysis of gerrymandering will include measures of political fairness. Examples of recent court disallowed redistricting plans will be analyzed, including legal basis and measurement approaches.
8	Voting rights – history of voting rights of former slaves and of women will be presented. Review of voting rights during Reconstruction and the Jim Crow era, leading to the passage of the Voting Rights Act (VRA). Voting history data from before and after the passage of the VRA will be analyzed.
9	VRA history and issues will be discussed, including judicial revisions to the VRA. Criteria for enforcement of the VRA will be discussed. Techniques to measure racially polarized voting, notably software for ecological inference will be introduced. Current Supreme Court cases will be discussed, including one that is predicted to disallow parts of the VRA. Responses to the weakening of the VRA will be discussed, including progress in state VRAs.
10	MCMC analysis - Markov Chain, Monte Carlo (MCMC) analysis of redistricting plans will be reviewed, including the generation of Box & Whisker plots. Supreme Court cases using this technique will be reviewed.

Week	Topics
11	Textual data analysis techniques – Textual analysis tools for automated understanding of legislation, court decisions, etc. will be reviewed. Analysis approaches include sentiment analysis. Social media – Personality measures that relate to political preferences and susceptibility to political influence will be reviewed. Description of the use of social media in elections, including Twitter and Facebook. Strategies for message amplification; policies for content review; successful strategies to reduce the negative impact of social media in political campaigns.
12	Micro-targeting – Techniques for identifying and targeting audiences susceptible to political messages. Delivery techniques using on-air advertising and social media. Examples taken from the 2016 U.S. Presidential election.
13	Election security – Electronic security of voting machinery and voting rolls will be reviewed. Security of administrative policies for the processing of absentee ballots. Examples of election interference in recent elections. Surveillance – Technologies used to gather data concerning voter behaviors and preferences. Policy implications related to surveillance and personal privacy.
14	Case studies

Lab Environment

To complete the homework assignments, you will need to either use the Stony Brook University Lab facilities (Computer Science Labs and Synch Sites) and/or install the required software on your computer.

Assignment Information

Every week you will be assigned reading. There will also be assignments during the semester, approximately one every 2-3 weeks. On-time submission of the assignments will count as the assignment portion of your grade. The material in the programming assignments constitutes a large component of the mid-term and final exams.

When you submit an assignment, please include the following in the body of the e-mail.

- Section number
- ISE369/POL369 ID (note that every student will be given a unique number for the duration of the course)
- Name
- Homework number

Grades and Exams

This is a three-credit graded course. Your final grade is based primarily on your exam and quiz scores (mid-term and final exams, along with 2-5 quizzes). Assignments will be graded on a range of 0-10, and the total of all the assignments will constitute your assignment grade. Any late assignments will be accepted up to 2 days after the due date, but there will be a 2-point penalty for any late submission. Assignment and quiz grades will be normalized so the final grade in each category will be in the range 0-100. There will also be an oral communications score, which is determined by the quality of in-class interactions. The weighting of the midterm exam, the final exam, the quizzes, HW assignments, and oral communications is 35/25/20/10/10. The weighting of grade components will be used to determine the ranking of each student in the class. Final grades will be assigned based on the ranking, with a grade distribution reasonably consistent with similar courses.

Extra points may be added to your exam scores for correct answers to certain in-class questions during regular class meetings. We will also have in-class hands-on programming exercises. You can work on these exercises in a small group (sharing a computer), and the first group to complete the exercise may receive extra credit in the subsequent exam.

All the exams will be closed book. However, portions of relevant class libraries and APIs will be provided to you, if necessary. The exams will be composed of some short answer questions and some programming questions. For the programming questions, your understanding of the concepts will be more important than your knowledge of the exact syntax.

Be sure to bring your student ID to all exams. The TAs will check your ID, and no one will be allowed to take an exam without the proper ID.

Be sure to be in class on-time for you assigned examination time since there will be no make-up exams. However, students participating in university-sponsored activities will be offered options for make-up of exams and assignments consistent with the University policy as stated in the Undergraduate Bulletin. Similarly, accommodations for students concerning syllabus assignment and exam policies for religious reasons will be granted consistent with Undergraduate Bulletin policies.

The Pass/No Credit (P/NC) option is not available for this course.

The class includes some hands-on programming, so you will require access to a computer and a development environment. The class-standard development environment is included in computers in the Computer Science Labs. If you need to quickly set up an account, please contact the Computer Science (CS) Department system staff. You will need to provide the CS Systems staff with your student ID and an e-mail address. An e-mail will be sent to you when the account is ready.

TA

The class TAs are available to help you in understanding the material in many ways. They will provide hints and suggestions when they respond to your submission of a homework assignment. They may also be available in teaching sessions.

The TAs and the instructor will be coordinating hints and instructions concerning HW assignments through an on-line forum (e.g., Piazza). Piazza is a Q&A platform designed to get answers from

classmates and instructors. It serves as a forum to allow you to collaborate and solve common challenges. You can post any questions you have or errors you may encounter, and we will post our answers in the forum directly. You are also encouraged to answer any questions posted by your classmates. This way when an issue is resolved, everyone is able to learn from the answer.

We will also be posting assignment-specific instructions or notices on the forum, so make sure you sign up. For the sake of academic integrity, you should avoid posting your actual code in the discussion forums. If you feel it is absolutely necessary, you can check either with the instructor or one of the TAs.

Academic Integrity & Behavior

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty members are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html.

Failure to disclose AI use, misrepresenting AI-generated work as entirely your own, or using AI in ways that undermine the learning objectives of the course may constitute a violation of the University Academic Integrity Policy and can result in a referral to the academic judiciary

Special Assistance

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Student Accessibility Support Center. For procedures and information go to the following website: <https://ehs.stonybrook.edu/programs/fire-safety/emergencyevacuation/evacuation-guide-people-physical-disabilities>

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Until/unless the latest COVID guidance is explicitly amended by SBU, during Spring 2022 "disruptive behavior" will include refusal to wear a mask during classes. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook. For the latest COVID guidance, please refer to: <https://www.stonybrook.edu/commcms/strongertogether/latest.php>

Use of Artificial Intelligence

The use of artificial intelligence (AI) tools is permitted and encouraged as a learning aid when used responsibly and transparently. AI tools include, but are not limited to, generative text tools (e.g., Microsoft Copilot, Google Gemini, etc.), AI-enhanced grammar and writing tools, data analysis tools, image generators, and discipline-specific AI applications relevant to data analysis of political science data.

You may use AI tools to support learning tasks such as [brainstorming ideas, exploring concepts, checking clarity or grammar, practicing problem-solving, generating feedback on drafts, or other learning tasks here]. However, AI tools should not replace your own thinking, analysis, or decision-making. All submitted work must reflect your understanding of the course material and achievement of the stated learning outcomes.

Please be aware that AI tools can produce biased, misleading, or inaccurate results. You are responsible for critically evaluating and confirming the accuracy of any AI-generated content used in their coursework. You should also consider data privacy implications, as many AI platforms may retain or reuse user-provided content. Do not upload copyrighted materials, original work, or personal information unless explicitly permitted.

You are expected to critically evaluate and verify any AI-generated content before using it. You must clearly disclose AI when submitting work, including what tool was used, how it was used, and at what stage of the assignment (e.g., idea generation, drafting, revision). AI-assisted work must comply with citation and attribution guidelines outlined in [citation style].

Reading

Textbook chapter readings and supplemental readings will be assigned during the semester.

Textbooks

1. The Politics of Congressional Elections, 11th Edition (or 10th Edition, Jamie L. Carson and Gary C. Jacobson, Rowman & Littlefield Publishers, 2024, ISBN-13: 978-1538176733.
2. Data Analysis for Political Science, Robert F. Kelly, 2026. Chapters of this in-preparation textbook will be provided in class.
3. Python for Data Analysis, 2nd Edition, Wes McKinney, O'Reilly Media, Inc., October, 2017, ISBN-13: 978-1-491-95766-0. (not required, but helpful)