

## **Master of Science in Political Analytics**

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### **POAN 5010 - Introduction to Political Analytics**

**Scheduled Meeting Times: TBD**

**2 credits, Online, Core course**

**Instructor:**

**Office Hours:**

**Response Policy:**

**Facilitator/Teaching Assistant, if applicable: TBD**

**Office Hours:** TBD

**Response Policy:** TBD - but aiming for the same: Emails will be addressed within one (1) business day.

### **Course Overview**

Analytics and data-driven decision-making are playing an ever-larger role in modern political campaigns, advocacy groups, and media coverage of politics. This phenomenon builds on the increasing availability of “big data” in politics: augmented voter files covering hundreds of millions of registered voters, databases of donors and volunteers, online clicks and likes, an explosion of polling options, and much more. As a result, data practitioners now play a key role in determining the direction of American politics.

This course will familiarize you with a range of foundational statistical methods and the ways in which they can be practically applied to politics and related fields. You will also learn about the role of big data and analytics in contemporary US politics, with a focus on key data sources and their uses. This course lays the groundwork for more specialized courses and will help you consider which types of knowledge and skills you want to acquire as you progress through the degree program.

This core course is required for all students in the Political Analytics program, and should be taken at the beginning of the sequence. This course will be delivered online and will meet once per week for seven weeks. By the end of the course, you should have a working knowledge of the statistical concepts that will allow you to take subsequent courses in quantitative methods. There are no prerequisites for this course.

### **Learning Objectives**

Upon successful completion of this course, students should be able to:

- L1. Analyze political data sets in the R statistical programming language and environment.
- L2. Explain summary statistics, correlations, and probability distributions.
- L3. Use basic hypothesis tests and estimation techniques.
- L4. Interpret bivariate and multivariate linear regression models.
- L5. Describe the rapidly growing impact of data analytics in the political sphere and related sectors.
- L6. Identify pathways for acquiring specialized knowledge in political analytics.

### **Readings**

#### **Books**

The primary textbook for this course will be:

Imai, Kosuke. *Quantitative Social Science: An Introduction*. Princeton University Press, 2018.

**Other Required Readings (available through Canvas course site or web link)**

Atkinson, Matthew D., Ryan D. Enos, and Seth J. Hill. "Candidate faces and election outcomes: Is the face–vote correlation caused by candidate selection?." *Quarterly Journal of Political Science* 4.3 (2009): 229-249.

Bertrand, Marianne, and Sendhil Mullainathan. "Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination." *American Economic Review* 94.4 (2004): 991-1013.

Gerber, Alan S., Donald P. Green, and Christopher W. Larimer. "Social pressure and voter turnout: Evidence from a large-scale field experiment." *American Political Science Review* 102.1 (2008): 33-48.

Gerber, Alan, and Neil Malhotra. "Do statistical reporting standards affect what is published? Publication bias in two leading political science journals." *Quarterly Journal of Political Science* 3.3 (2008): 313-326.

Issenberg, Sasha. "How Obama's Team Used Big Data to Rally Voters." *MIT Technology Review*, December 2012. <https://www.technologyreview.com/2012/12/19/114510/how-obamas-team-used-big-data-to-rally-voters/>

Lyall, Jason, Graeme Blair, and Kosuke Imai. "Explaining support for combatants during wartime: A survey experiment in Afghanistan." *American Political Science Review* 107.4 (2013): 679-705.

McCarty, Nolan, Keith T. Poole, and Howard Rosenthal. *Polarized America: The dance of ideology and unequal riches*. MIT Press, 2016. [Chapter 2 - Polarized Politicians]

Todorov, Alexander, et al. "Inferences of competence from faces predict election outcomes." *Science* 308.5728 (2005): 1623-1626.

**Supplemental Materials**

The following methods books are not required but may be helpful to refer to for additional explanations of statistical topics:

- Stock, James H., and Mark W. Watson. *Introduction to Econometrics*, 2nd ed. Pearson Education, 2007.
- Békés, Gábor, and Gábor Kézdi. *Data Analysis for Business, Economics, and Policy*. Cambridge University Press, 2021.

**Software**

This course will be taught in R, which is free and open source. R can be run in Rstudio which can be downloaded using the instructions at this link: <https://www.rstudio.com/products/rstudio/download/#download>. Students should first download R, the language, using this link: <https://cran.rstudio.com>.

**Assignments and Assessments**

The following assignments will be required for students to complete throughout the course. Submission and grading requirements will be listed in Canvas.

**Class Participation, Attendance, and Responses (15%) [L1, L2, L3, L4, L5, L6]** You are expected to attend all class sessions, come to class on time, complete all assigned readings, and engage in weekly online discussions. The instructor will ask for some basic information about your background and interests in the first week and for your reflections about the readings and the assignments in weekly discussion forums in the following weeks. Completing these responses will be considered part of your participation. The weekly discussion forums will require an initial response by Wednesdays and follow up to classmates by Sundays. You will also be asked to complete two self-reflections during the course. Full details will be provided in the Canvas course site. If you need to miss a class for any reason, please discuss the absence with the instructor in advance.

**Introduction to R (10%) [L1]** This assignment will require you to set up your R environment and work through some code and examples that the instructor will provide. The instructor will provide detailed directions for the assignment on Canvas and an example of what the output should look like. You will return your code and output to complete the assignment. This assignment is intended to get you ready for subsequent assignments in R and will be graded as complete/incomplete.

**Quantitative Assignments 1-5 (10% each, 50% total)** These assignments will be due once per week from weeks 2 - 6. They will be due by the end of each week's module, so by Sunday night at 11:59pm Eastern. The assignments will require you to use the concepts and skills covered in that week's readings and class as outlined in the course schedule. The assignments will include 5-10 questions that require a mix of statistical coding, analysis, and written responses. The instructor will provide detailed instructions and examples for each assignment and relevant data sets to be used in the analysis on Canvas. The coding portions of the assignments will be completed in R and additional questions should be answered in written form. You are welcome to ask each other general questions in our online forum (as well as ask the instructor questions), but should complete their assignments individually. Brief descriptions of what each assignment covers are as follows:

- Quantitative Assignment 1 [L1, L2] - This assignment will cover descriptive statistics and the problem of causality.
- Quantitative Assignment 2 [L1, L2] - This assignment will cover univariate analysis, sampling, and probability distributions.
- Quantitative Assignment 3 [L1, L2, L3] - This assignment will cover bivariate analysis, expectation and variance, and the central limit theorem.
- Quantitative Assignment 4 [L1, L2, L3] - This assignment will cover estimation and hypothesis testing.
- Quantitative Assignment 5 [L1, L2, L3, L4] - This assignment will cover bivariate (simple) regression.

For each of these five assignments, you will be evaluated on your statistical code and responses to written questions about analysis and interpretation.

**Final Assignment (25%) [L1, L2, L3, L4, L5, L6]** The final assignment will cover the new information covered in module 7 (multivariate regression) as well as ask students to work through problems that use skills from the previous weeks. In this way it will provide a cumulative assessment of the skills learned over the span of the course. The final assignment is intended to be about twice as much work as a typical assignment. You are welcome to ask each other general questions in our online forum (as well as ask the instructor questions), but should complete their assignments alone. You will be evaluated on your statistical code and responses to written questions about analysis and interpretation. Additional detail will be provided for the final assignment with the instructions in Canvas.

## Grading

The final grade will be calculated as described below:

**FINAL GRADING SCALE**

Grade	Percentage
A+	98–100 %
A	93–97.9 %
A-	90–92.9 %
B+	87–89.9 %
B	83–86.9 %
B-	80–82.9 %
C+	77–79.9 %
C	73–76.9 %
C-	70–72.9 %
D	60–69.9 %
F	59.9% and below

Assignment/Assessment	% Weight	Individual or Group/Team Grade
Class Participation, Attendance, and Responses	15%	Individual
Introduction to R	10%	Individual
Quantitative Assignment 1	10%	Individual
Quantitative Assignment 2	10%	Individual
Quantitative Assignment 3	10%	Individual
Quantitative Assignment 4	10%	Individual
Quantitative Assignment 5	10%	Individual
Final Assignment	25%	Individual

**Course Schedule/Course Calendar**

Module/Week			
Module/Week & Topic with specific dates	Topic	Readings	Activities/Assignments for this module
Module 1 (L1, L5, L6)	Introduction to Political Data	Textbook: Quantitative Social Science - Imai Chapter 1: 1.1 - 1.4 (26 pages)	Complete readings

	Introduction to using R in the course	<p>Articles:</p> <p>Sasha Issenberg. "How Obama's Team Used Big Data to Rally Voters." <i>MIT Technology Review</i>, December 2012. (21 pages)</p>	<p>Participate in "Getting to Know You Discussion" forum before the week begins</p> <p>Attend the Class Session</p> <p>Complete "Introduction to R" Assignment (completion grade) by Sunday at 11:59PM ET.</p> <p>Complete and Submit the New Student Questionnaire before the module end</p>
Module 2 (L1, L2)	<p>Causality</p> <p>Experiments and Observational Studies</p> <p>Descriptive Statistics</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 2: 2.1 - 2.7 (37 pages)</p> <p>Articles:</p> <p>Bertrand, Marianne, and Sendhil Mullainathan. "Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination." <i>American Economic Review</i> 94.4 (2004): 991-1013. (22 pages)</p> <p>Supplemental Materials:</p> <p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Quantitative Assignment 1 by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later than Sundays at 11:59 PM ET.</p>
Module 3 (L1, L2)	<p>Univariate Analysis</p> <p>Sampling</p> <p>Random Variables and Probability Distributions</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 3: 3.1 - 3.4 (21 pages) Chapter 6: 6.3 - 6.3.4 (15 pages)</p> <p>[I'll need a new journal article reading, the Lyall et al. paper is too complicated]</p> <p>Supplemental Materials:</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Quantitative Assignment 2 by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later</p>

		<p>Lyall, Jason, Graeme Blair, and Kosuke Imai. "Explaining support for combatants during wartime: A survey experiment in Afghanistan." <i>American Political Science Review</i> 107.4 (2013): 679-705. (26 pages)</p> <p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	<p>than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later than Sundays at 11:59 PM ET.</p> <p>Complete Self-Reflection by Sunday at 11:59PM ET.</p>
<p>Module 4 (L1, L2, L3)</p>	<p>Bivariate Analysis</p> <p>Expectation and Variance</p> <p>Law of Large Numbers</p> <p>Central Limit Theorem</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 3: 3.5 - 3.8 (20 pages) Chapter 6: 6.3.5 - 6.5 (15 pages)</p> <p>McCarty, Nolan, Keith T. Poole, and Howard Rosenthal. <i>Polarized America: The dance of ideology and unequal riches</i>. mit Press, 2016. Chapter 2 - Polarized Politicians (52 pages)</p> <p>Supplemental Materials:</p> <p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Quantitative Assignment 3 by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later than Sundays at 11:59 PM ET.</p>
<p>Module 5 (L1, L2, L3)</p>	<p>Estimation</p> <p>Hypothesis Testing</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 7: 7.1 - 7.2.5 (47 pages)</p> <p>Gerber, Alan, and Neil Malhotra. "Do statistical reporting standards affect what is published? Publication bias in two leading political science journals." <i>Quarterly Journal of Political Science</i> 3.3 (2008): 313-326. (13 pages)</p> <p>Supplemental Materials:</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Quantitative Assignment 4 by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later</p>

		<p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	<p>than Sundays at 11:59 PM ET.</p>
<p>Module 6 (L1, L2, L3, L4)</p>	<p>Bivariate Regression</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 4: 4.1 - 4.2 (38 pages)</p> <p>Todorov, Alexander, et al. "Inferences of competence from faces predict election outcomes." <i>Science</i> 308.5728 (2005): 1623-1626. (3 pages)</p> <p>Atkinson, Matthew D., Ryan D. Enos, and Seth J. Hill. "Candidate faces and election outcomes: Is the face-vote correlation caused by candidate selection?." <i>Quarterly Journal of Political Science</i> 4.3 (2009): 229-249. (20 pages)</p> <p>Supplemental Materials:</p> <p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Quantitative Assignment 5 by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later than Sundays at 11:59 PM ET.</p> <p>Complete Self-Reflection by Sunday at 11:59PM ET.</p>
<p>Module 7 (L1, L2, L3, L4, L5, L6)</p>	<p>Multivariate Regression</p>	<p>Textbook:</p> <p>Quantitative Social Science - Imai Chapter 4: 4.3 - 4.5 (21 pages) Chapter 7: 7.3 (14 pages)</p> <p>Gerber, Alan S., Donald P. Green, and Christopher W. Larimer. "Social pressure and voter turnout: Evidence from a large-scale field experiment." <i>American Political Science Review</i> 102.1 (2008): 33-48. (15 pages)</p> <p>Supplemental Materials:</p>	<p>Complete readings</p> <p>Attend the Class Session</p> <p>Complete Final Assignment by Sunday at 11:59PM ET.</p> <p>Participate in Weekly Discussion Forum by posting an initial response by no later than Wednesday at 11:59 PM ET, and posting at least one additional response to your classmates' posts by no later than Sundays at 11:59 PM ET.</p>

		<p>Stock, James H., and Mark W. Watson. <i>Introduction to Econometrics</i>, 2nd ed. Pearson Education, 2007.</p> <p>Békés, Gábor, and Gábor Kézdi. <i>Data Analysis for Business, Economics, and Policy</i>. Cambridge University Press, 2021.</p>	
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## Course Policies

### *Participation and Attendance*

I expect you to come to class on time and thoroughly prepared. I will keep track of attendance and look forward to an interesting, lively and confidential discussion. If you miss an experience in class, you miss an important learning moment and the class misses your contribution. More than one absence will affect your grade, lowering your class grade by  $\frac{1}{3}$  of a grade for every additional absence after the first (e.g., from a B+ to a B).

### *Late work*

Work that is not submitted on the due date noted in the course syllabus without advance notice and permission from the instructor will be graded down  $\frac{1}{3}$  of a grade for every day it is late (e.g., from a B+ to a B).

### *Citation & Submission*

All written assignments must use standard citation format, MLA, and cite sources. All assignments must be submitted to the course website (not via email).

## School and University Policies and Resources

### *Copyright Policy*

Please note—Due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

### *Academic Integrity*

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.



SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at <https://sps.columbia.edu/students/student-support/academic-integrity-community-standards>. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

#### *Diversity Statement*

It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

#### *Accessibility*

Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: <https://health.columbia.edu/services/ods/support>.

#### *Class Recordings*

All or portions of the class may be recorded at the discretion of the Instructor to support your learning. At any point, the Instructor has the right to discontinue the recording if it is deemed obstructive to the learning process.

If the recording is posted, it is confidential and it is prohibited to share the recording outside of the class.

#### *SPS Academic Resources*

The Office of Student Affairs provides students with academic counseling and support services such as online tutoring and career coaching: <https://sps.columbia.edu/students/student-support/student-support-resources>.

#### *Columbia University Information Technology*

[Columbia University Information Technology](#) (CUIT) provides Columbia University students, faculty and staff with central computing and communications services. Students, faculty and staff may access [University-provided and discounted software downloads](#).

#### *Columbia University Library*

[Columbia's extensive library system](#) ranks in the top five academic libraries in the nation, with many of its services and resources available online.

#### *The Writing Center*

The Writing Center provides writing support to undergraduate and graduate students through one-on-one consultations and workshops. They provide support at every stage of your writing, from brainstorming to final drafts. If you would like writing support, please visit the following site to learn about services offered and steps for scheduling an appointment. This resource is open to Columbia graduate students at no additional charge. Visit <http://www.college.columbia.edu/core/uwp/writing-center>.

#### *Career Design Lab*

The Career Design Lab supports current students and alumni with individualized career coaching including career assessment, resume & cover letter writing, agile internship job search strategy, personal branding, interview skills,

career transitions, salary negotiations, and much more. Wherever you are in your career journey, the Career Design Lab team is here to support you. Link to <https://careerdesignlab.sps.columbia.edu/>

### *Netiquette*

Online sessions in this course will be offered through Zoom, accessible through Canvas. A reliable Internet connection and functioning webcam and microphone are required. It is your responsibility to resolve any known technical issues prior to class. Your webcam should remain turned on for the duration of each class, and you should expect to be present the entire time. Avoid distractions and maintain professional etiquette.

**Please note:** Instructors may use Canvas or Zoom analytics in evaluating your online participation.

More guidance can be found at [https://jolt.merlot.org/vol6no1/mintu-wimsatt\\_0310.htm](https://jolt.merlot.org/vol6no1/mintu-wimsatt_0310.htm)

Netiquette is a way of defining professionalism for collaborations and communication that take place in online environments. Here are some Student Guidelines for this class:

- Avoid using offensive language or language that is not appropriate for a professional setting.
- Do not criticize or mock someone's abilities or skills.
- Communicate in a way that is clear, accurate and easy for others to understand.
- Balance collegiality with academic honesty.
- Keep an open-mind and be willing to express your opinion.
- Reflect on your statements and how they might impact others.
- Do not hesitate to ask for feedback.
- When in doubt, always check with your instructor for clarification.