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|  | | SYLLABUS | |
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| Special Topics in Research Methods | W 3:55pm-6:40pm | | |
| POLS 8500 | Fall 2023 | | |
| Section 42730 | Baldwin 307 | | |
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| **Course Description and Prerequisites** | | | |
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| Special topics in advanced research methodology. **Prerequisites:** POLS 7050 or equivalent course | | | |
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| **Learning Outcomes or Course Objectives** | | | |
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| By the end of the course, students will be able to:   * Articulate the challenges and opportunities presented by autocorrelation in observational data * Detect and visualize autocorrelation in time series, cross-sectional, and time-series cross-sectional data * Estimate and interpret dynamic regressions and spatial regressions in the generalized linear model * Consume advanced texts detailing the latest techniques for modelling autocorrelation | | | |
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| **Instructor Information** | | | |
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| Dr. Garrett N. Vande Kamp | | | T 2:00 – 4:00 |
| garrettvandekamp@uga.edu | | | Baldwin 409 |
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| **Textbook and/or Resource Material** | | | |
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| Textbooks*:* The following textbooks are good introductions to dynamic and spatial regression models, listed in alphabetical order. Required texts are bolded.  Time Series:  Box-Steffensmeier, Janet M., John R. Freeman, Matthew P. Hitt, Jon C. W. Pevehouse. 2014. *Time Series Analysis for the Social Sciences.* Analytical Methods for Social Research. Cambridge: Cambridge University Press.  **Pickup, Mark. 2015. *Introduction to Time Series Analysis.* Quantitative Applications in the Social Sciences. Thousand Oaks, CA: SAGE Publishing.**  Spatial:  Darmofal, David. 2015. *Spatial Analysis for the Social Sciences.* Analytical Methods for Social Research. Cambridge: Cambridge University Press.  Elhorst, J. Paul. 2014. *Spatial Econometrics: From Cross-Sectional Data to Spatial Panels*. Springer.  Pebesma, Edzer and Roger Bivand. 2023. *Spatial Data Science with Applications in R*. Chapman and Hall/CRC. https://r-spatial.org/book/  **Ward, Michael D. and Kristian S. Gleditsch. 2018. *Spatial Regression Models*, Second Edition. Quantitative Applications in the Social Sciences. Thousand Oaks, CA: SAGE Publishing.**  One of the following software will be required:  R. R Core Team. (In class examples and instructional files will use this software)  STATA 16, IC. StataCorp. (Additional code will be annotated in instructional files)  In addition, journal articles will be required reading during the semester. They can be accessed through the university’s resources available freely to students. | | | |
| **Class Format and Attendance Policy** | | | |
| The course is an in-person class. Attendance is discretionary, but multiple absences may result in the professor’s consultation with a student’s Director of Graduate Studies (or similar officer).  In the absence of written authorization from the UGA Disability Resource Center, students may not make a visual or audio recording of any aspect of this course. In the event an authorization, the student and faculty must come to a written agreement that ensures recordings will only be used for personal academic use, not to violate the privacy of those in attendance nor to monetize off the content of the lectures. Violation of these terms may subject them to discipline under the Student Code of Conduct or subject them to liability under copyright laws. | | | |
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| **Grading Policies and Grading Scale** | | | |
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| Homework 40%  Final Exam 30%  Research Paper 30% | | | A = 90-100  B = 80-90  C = 70-80  D = 60-70  F < 60 |
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| **Homework**: Students will receive practical homework to implement the methods learned in class. Homework will be graded for participation. Students will also submit memos detailing their understanding of particular course topics post-submission, with their purpose being to inform the professor when review of a topic is necessary.  **Research Paper**: Students will write a research paper on a topic of their choice that is related to their research agenda and employs the quantitative methods learned in this class. Students may write a replication and extension paper or an original research paper. Ideally, students should produce a paper that can either be used in their dissertation or be submitted to a peer-reviewed journal. This paper may be one written for another class, given that the student has permission from other instructor(s) the student is currently taking classes with. This paper cannot be coauthored with a professor or another student in this class. The paper will be due  **Final Exam**: Students will have an in-person, open-book final exam administered on eLC. | | | |
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| **Major Class Dates** | | | |
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| Wednesday-Tuesday, August 16-22: Add/Drop Period  Monday, September 4: Labor Day (No classes)  Monday, October 23: Withdrawal Deadline  Friday, October 27: Fall Break (No classes)  Wednesday-Friday, November 22-24: Thanksgiving (No classes)  Friday, December 8 (3:30 PM): Final Exam | | | |
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| **Mental Health and Wellness Resources** | | | |
| * *If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit*[*https://sco.uga.edu*](https://sco.uga.edu/)*. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.* * *UGA has several resources for a student seeking mental health services (*[*https://www.uhs.uga.edu/bewelluga/bewelluga*](https://www.uhs.uga.edu/bewelluga/bewelluga)*) or crisis support (*[*https://www.uhs.uga.edu/info/emergencies*](https://www.uhs.uga.edu/info/emergencies)*).* * *If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (*[*https://www.uhs.uga.edu/bewelluga/bewelluga*](https://www.uhs.uga.edu/bewelluga/bewelluga)*) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.* * *Additional resources can be accessed through the UGA App.* | | | |
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| **Academic Integrity** | | | |
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| UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others."  In this course, academic dishonesty could include plagiarism and unauthorized assistance. A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at [www.uga.edu/ovpi](http://www.uga.edu/ovpi) . | | | |
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| **Syllabus as a Contract** | | | |
| This syllabus is a contract between the professor and the individual student. Every student in this class receives an identical syllabus; therefore, every student in this class will be taught and evaluated in the same manner. This syllabus is unique to this class; therefore, the students in this class may not be taught and evaluated as students in other sections of this class, past or present, even if taught by the same professor. | | | |
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| **A Word of Thanks** | | | |
| I appreciate the help of my peers who contributed to the creation of this syllabus: Scott Cook, Guy Whitten, Clayton Webb, and Andrew Philips.  That being said, this syllabus and associated course materials are the intellectual property of the instructor and subject to copyright law. Do not reproduce any course materials without explicit written permission. Recordings of class lectures is explicitly forbidden. | | | |

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| **Tentative Course Calendar** |
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| The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. |
| **Week 1: Review of Matrix Algebra and Linear Model**  **Modelling Dependence in a Single Dimension** **Week 2: Autocorrelation: Detection, Visualization, and “Cures”**  *Needed packages: tidyverse, sf, spdep, rnaturalearth*  Pickup, Chapter 2-3  Ward and Gleditsch, Chapters 2 and 3  **Week 3: Dynamic Regression Models – Opportunities for Richer Inferences**  *Needed packages: dynamac*  Pickup, Chapters 3 and 4  De Boef, Suzanna and Luke Keele. 2008. “Taking time seriously.” *American Journal of Political Science*: 52(1): 184-200.  Historical References:  Pickup, Chapter 5  **Week 4: Dynamic Regression Models – Challenges and Appropriate Solutions**  Pickup, Chapter 5.  Wilkins, Arjun S. 2018. "To lag or not to lag?: Re-evaluating the use of lagged dependent variables in regression analysis." *Political Science Research and Methods* 6(2): 393-411.  Vande Kamp, Garrett N. and Soren Jordan. Forthcoming. “The Necessity of Moving Averages in Dynamic Linear Regression Models.” *American Journal of Political Science*  Webb, Clayton and Suzanna Linn. 2020. “A Principled Approach to Time Series Analysis.” In *The SAGE Handbook of Research Methods in Political Science and International Relations*, First Edition. Edited by Luigi Curini and Robert Franzese. pp. 600-615. Los Angeles: Sage Reference.  Historical references:  Achen, Christopher H. 2000. “Why lagged dependent variables can suppress the explanatory power of other independent variables.” Unpublished Manuscript.  Keele, Luke, and Nathan J. Kelly. 2006. “Dynamic models for dynamic theories: The ins and outs of lagged dependent variables.” *Political Analysis* 14(2): 186-205.  **Week 5: Spatial Regression Models – Opportunities for Richer Inferences**  *Needed packages: spatialreg*  Ward and Gleditsch, Chapter 4  Fingleton, Bernard. 2009. "Spatial autoregression." *Geographical Analysis* 41(4): 385-391.  Wimpy, Cameron, Guy D. Whitten, and Laron K. Williams. 2021. "X marks the spot: unlocking the treasure of spatial-X models." *The Journal of Politics* 83(2): 722-739.  Whitten, Guy D., Laron K. Williams, and Cameron Wimpy. 2019. "Interpretation: the final spatial frontier." *Political Science Research and Methods* (2019): 1-17.  **Week 6: Spatial Regression Models – Challenges and Appropriate Solutions**  *Needed packages: cshapes*  Ward and Gleditsch, Chapter 5  Neumayer, Eric and Thomas Plumper. 2016. “W.” *Political Science Research and Methods* 4(1): 175-193.  Cook, Scott J., Jude C. Hays, and Robert J. Franzese. 2020. “Model Selection and Spatial Interdependence.” In *The SAGE Handbook of Research Methods in Political Science and International Relations*, First Edition. Edited by Luigi Curini and Robert Franzese. pp. 730-747. Los Angeles: Sage Reference.  Historical references:  Beck, Nathaniel, Kristian Skrede Gleditsch, and Kyle Beardsley. 2006. "Space is more than geography: Using spatial econometrics in the study of political economy." *International studies quarterly* 50(1): 27-44.  **Week 7: Stationarity, Ergodicity, and Valid Inferences in Time and in Space**  *Needed packages: tseries*  Pickup Chapters 2 and 6  Pickup, Mark, and Paul M. Kellstedt. 2023. "Balance as a pre-estimation test for time series analysis." *Political Analysis* 31(2): 295-304.  Mur, Jesús, and F. Javier Trívez. 2003. "Unit roots and deterministic trends in spatial econometric models." *International Regional Science Review* 26(3): 289-312.  Fingleton, Bernard. 1999. "Spurious spatial regression: some Monte Carlo results with a spatial unit root and spatial cointegration." *Journal of regional science* 39(1): 1-19.  **Modelling Dependence in Multiple Dimensions**  **Week 8: Unobserved Effects – Beyond Fixed Effects and Random Effects**  *Needed packages: sandwich, plm*  Arceneaux, Kevin, and David W. Nickerson. 2009. “Modeling certainty with clustered data: A comparison of methods.” *Political Analysis* 17(2):177-190.  Bell, Andrew, and Jones, Kelvyn. 2015. “Explaining fixed effects: Random effects modeling of time-series cross sectional and panel data.” *Political Science Research and Methods* 3(1):133-153.  Esarey, Justin, and Andrew Menger. 2019. "Practical and effective approaches to dealing with clustered data." *Political Science Research and Methods* 7(3): 541-559.  **Week 9: Modelling Autocorrelation in TSCS Data**  *Needed packages: splm*  Plümper, Thomas and Vera E. Troeger. 2018. “Not so Harmless After All: The Fixed-Effects Model.” *Political Analysis* 27(1): 21-45.  Cook, Scott J., Jude C. Hays, and Robert J. Franzese. 2023. "STADL Up! The Spatiotemporal Autoregressive Distributed Lag Model for TSCS Data Analysis." *American Political Science Review* 117(1): 59-79.  Historical References:  Beck, Nathaniel, and Jonathan N. Katz. 1993. "What to do (and not to do) with time-series cross-section data." *American Political Science Review* 89(3): 634-647.  Beck, Nathaniel, and Jonathan N. Katz. 2011. "Modeling dynamics in time-series–cross-section political economy data." *Annual Review of Political Science* 14: 331-352.  **Week 10: Autocorrelation in Binary TSCS Data**  *Needed packages: spmle <devtools::install\_github("hunzikp/spmle")>*  Wucherpfennig, Julian, et al. "A fast estimator for binary choice models with spatial, temporal, and spatio-temporal interdependence." *Political Analysis* 29.4 (2021): 570-576.  Carter, David B. and Curtis S. Signorino. 2010. “Back to the future: Modeling time dependence in binary data.” *Political Analysis* 18(3):271-292.  Beck, Nathaniel, David Epstein, Simon Jackman, and Sharyn O’Halloran. 2001. “Alternative Models of Dynamics in Binary Time-Series-Cross-Section Models: The Example of State Failure.” Institute for Social and Economic Research and Policy Working Papers, Columbia University.  Cook, Scott J., Jude C. Hays, and Robert J. Franzese. 2020. “Fixed Effects in Rare Events Data: A Penalized Maximum Likelihood Approach,” *Political Science Research and Methods*. 8(1): 92-105.  **Week 11: Autocorrelation in Count TSCS Data**  Vande Kamp, Garrett N. and Soren Jordan. N.d. “A Log-Linear Autoregressive Count Model that is Trivial to Estimate.” Unpublished manuscript.  Franzese, Robert J.and Jude C. Hays. 2017. “A Comparison of the Small-Sample Properties of Several Estimators for Spatial-Lag Count Models” in Franzese, ed., *Advances in Political Methodology*, Elgar Research Collections, pp. 180-207.  Cameron, A. Colin, and Pravin K. Trivedi. 2013. *Regression analysis of count data*. Cambridge: Cambridge University Press. Chapter 7.  **Advanced Topics in Time and Space (Covered as Desired if Time Permits)**  **Week ?: Cointegration and Dynamic Relationships in Nonstationary Data**  Grant, Taylor, and Matthew J. Lebo. 2016. "Error correction methods with political time series." *Political Analysis* 24(1): 3-30.  Keele, Luke, Suzanna Linn, and Clayton M. Webb. 2016. “Treating Time with All Due Seriousness.” *Political Analysis* 24(1): 31-41.  **Week ?: Effect Heterogeneity and Multilevel Models**  Steenbergen, Marco R., and Bradford S. Jones. 2002. “Modeling multilevel data structures.” *American Journal of*  *Political Science* 46(1):218-237.  Hazlett, Chad, and Leonard Wainstein. 2022. "Understanding, choosing, and unifying multilevel and fixed effect approaches." *Political Analysis* 30(1): 46-65.  **Week ?: Multiplicative Interactions in Time and Space**  Warner, Zach. Forthcoming. “Conditional Relationships in Dynamic Models.”  Esarey, Justin, and Jacqueline HR DeMeritt. 2014. "Defining and modeling state-dependent dynamic systems." *Political Analysis* 22(1): 61-85.  **Week ?: Causal Inference in Time and Space**  Blackwell, Matthew, and Adam N. Glynn. 2018. "How to make causal inferences with time-series cross-sectional data under selection on observables." *American Political Science Review* 112(4): 1067-1082.  Reed, William Robert. 2015. "On the practice of lagging variables to avoid simultaneity." Oxford Bulletin of Economics and Statistics 77(6): 897-905.  Bellemare, Marc F., Takaaki Masaki, and Thomas B. Pepinsky. 2017. "Lagged explanatory variables and the estimation of causal effect." *The Journal of Politics* 79(3): 949-963.  Pickup, Mark. 2020. “Dynamic Systems of Equations.” In *The SAGE Handbook of Research Methods in Political Science and International Relations*, First Edition. Edited by Luigi Curini and Robert Franzese. pp. 600-615. Los Angeles: Sage Reference.  **Week ?: Forecasting**  Readings TBD  **Week ?: Dyadic Data, Triadic Data and Network Analysis**  Knoke, David and Song Yang. 2019. *Social Network Analysis.* Quantitative Applications in the Social Sciences. Thousand Oaks, CA: SAGE Publishing.  Plumper, Thomas and Eric Neumayer. 2020. “Dyadic Data Analysis.” In *The SAGE Handbook of Research Methods in Political Science and International Relations*, First Edition. Edited by Luigi Curini and Robert Franzese. pp. 717-729. Los Angeles: Sage Reference.  Santos Silva, JMC, and Silvana Tenreyro. 2006. "The log of gravity." *The Review of Economics and statistics* 88(4): 641-658.  Historical references:  Green, Donald P., Soo Yeon Kim, and David H. Yoon. 2001. "Dirty pool." *International Organization* 55(2): 441-468.  King, Gary. "Proper nouns and methodological propriety: Pooling dyads in international relations data." *International Organization* 55(2): 497-507. |
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