Political Science 304
Quantitative Study of War
Winter 2025

Instructor: Dr. Mark Nieman, mark.nieman@utoronto.ca

Time and Location: M 9–11am, see Acorn/Quercus

Student Hours: M 12–2pm, Sidney Smith 6026B

Teaching Assistant: Samuel Martin, sammorgan.martin@mail.utoronto.ca

Student Hours: TBA

Prerequisites: POL222, POL232 or equivalent.

Overview and Objectives

This course focuses on scientific explanations for militarized conflict and war. This means that rather than treating every war as a unique event, we investigate what characteristics make war more likely and which promote peace. In addition to learning theoretical explanations for why wars occur, students will evaluate these theories using common conflict datasets. They will also engage with how these datasets are created and the relationship between theory, measurement, data collection, and empirical testing.

Learning Outcomes

At the end of this course, students should be able to:

- Describe analytical approaches for studying militarized conflict.
- Derive testable implications from international relations theories of conflict.
- Apply quantitative methods to international relations data.
- Complete an empirical research paper that evaluates a hypothesis related to militarized conflict.

Required Texts

There are no required textbooks for this class. All required readings are available on Quercus. Articles can also be accessed through the university library. To find articles, search the article's author and title. Readings are expected to be completed prior to class.

Through not required, a supplementary text to use as a refresher for statistical concepts may be useful. Two that I recommend for political science students are: Paul Kellstedt and Guy Whitten's *The Fundamental of Political Science Research* (Cambridge University Press) and Kosuke Imai's *Quantitative Social Science: An Introduction* (Princeton University Press).

Required Software

- R (latest version) `https://www.r-project.org/`
- RStudio (latest version) `https://rstudio.com/products/rstudio/download/`
- R and RStudio frequently put out new versions; we will keep up by periodically checking and updating our software (to avoid various errors and inconsistencies).

Grading

Students demonstrate their mastery of the course material through class participation and completing regular in-class lab sessions, two take-home assignments, and a research paper.

Class participation: Class participation is a holistic assessment of positive contributions to classroom discussion and participation/completion of in-class lab sessions. In order to make thoughtful contributions to class discussion, students are required to have read the week's assigned readings prior to class and be able to describe the assigned readings' theory and findings. Most or all weeks also include a lab session. Labs introduce quantitative techniques and/or concepts from that week's readings and apply it to international relations data. Students should follow along during these labs and turn in their R script after each lab by midnight. Labs consist of required and optional components; student submissions are evaluated on completion of required components only.

Take-home Assignments: These assignments are designed to facilitate the completion of the independent research project. All assignments are to be double-spaced, with 1-inch margins, in Times New Roman size 12 font, using in-text citations following the scientific, or "author-date", style (e.g., Smith 2024). Please consult the *Journal of Politics* (JOP) style guide for other formatting questions and issues.

Research Proposal: A 2-page paper that descriptions of what empirical research project a student will complete by the end of term. It is **highly recommended** that students look ahead at topics (and preview relevant articles) covered in the class when considering their research question. The research proposal should include a research question and a theory that answers that question. The research question must: (1) identify a broad topic within the study of militarized conflict, (2) be analytical (i.e. not normative), (3) relate to a process (i.e. ask *how* or *why*, not yes/no), and (4) be able to be evaluated empirically using available quantitative data. The theory should provide a generalizable answer to the research question. The theory must: (1) clearly identify the dependent variable (topic to be explained); (2) clearly identify the independent variable (factor that explains) (3) link the independent variable to the dependent variable through a well-specified causal mechanism (i.e. the *process* in which the variation in the independent variables causes variation in the dependent variable); (4) derive at least one testable hypothesis or implication from the theory (i.e. a one-sentence summary of what effect a change in the independent variable has on the dependent variable).

Please note that students are free to change their research topic at any point after turning in the research proposal assignment. The research proposal that is submitted for that assignment, however, will be the only one that is graded.

Research Design: A 2-page document that outlines how to evaluate and test the theory's hypotheses. The research design should describe the quantitative research method that will be used, a relevant sample, and the level of analysis used in the study. It should also detail how the dependent and independent variables are operationalized and measured, and provide all data sources. Finally, the research design should discuss why the method, data, and measures are appropriate for evaluating the theory. It is **highly recommended** that students use the {peacesciencer} package in R—the first assigned reading—to organize their data, as this will give them access to a number of relevant data sets, ease generating samples and formatting data, and simply merges with any external datasets.

Please note that students are free to change their research design at any point after turning in the research design assignment. The research design that is submitted for that assignment, however, will be the only one that is graded.

Research Paper: The research paper expands on the theory and research design assignments to create a complete research paper. The final paper should incorporate all feedback from previous assignments, and use (at least one of) the quantitative techniques learned in class to empirically evaluate a theory related to international relations. The completed manuscript should read as a journal article, following the same structure as those that we have read in class: including introduction, literature review, theory and hypotheses, research design, empirical analysis, and conclusion sections. The literature review must include at least one of the assigned readings and the empirical analysis must compare the research paper's results to those from that same assigned reading. This will help ground the research paper in the relevant quantitative conflict literature.

Research papers should be between 10–15 pages, excluding references. The goal is for the paper to be publishable in an undergraduate social science journal.

Late assessments (without a prior agreement with the instructor) are deducted 2.5 percentage points of their value per day; assignments more than 7 days late (including weekends) are not accepted. The course follows the standard university grading scale. Final grade percentages are rounded to the nearest whole number.

Marking Scheme

Assessment	Percentage	Due Date
Participation/In-class labs	15	Lab: R scripts due by midnight of class day.
Research Proposal	20	January 31
Research Design	20	February 28
Research Paper	45	April 4
Total	100	

Schedule

Week 1: Introduction

Concepts: Quantitative Methods and Using R

Miller, Steven V. 2022. {peacesciencer}: An R Package for Quantitative Peace Science Research. *Conflict Management and Peace Science* 39(6): 755–779.

Week 2: Measuring Conflict

Concepts: Measuring Concepts, Summarizing Data

Jones, Daniel M., Stuart A. Bremer, and J. David Singer. 1996. Militarized Interstate Disputes, 1816–1992: Rationale, Coding Rules, and Empirical Patterns. *Conflict Management and Peace Science* 15(2): 163–213.

Week 3: Balancing and Bandwagoning

Concepts: Balance-of-power, Bivariate Analysis

Levy, Jack S. and William R. Thompson. 2010. Balancing on Land and at Sea. *International Security* 35(1): 7–43.

Kugler, Jacek and A.F.K. Organski. 1993. The Power Transition: A Retrospective and Prospective Evaluation. In Midlarsky, Manus I, ed. 1993. *Handbook of War Studies*. University of Michigan Press. pp 171—194.

Week 4: What States Fight Over

Concepts: Power vs Issues as War Causes, Bivariate Analysis

Bremer, Stuart. 1992. Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816-1965. *Journal of Conflict Resolution* 36(2): 309–341.

Hensel, Paul R., Sara McLaughlin Mitchell, Thomas E. Sowers II, and Clayton L. Thyne. 2008. Bones of Contention: Comparing Territorial, Maritime, and River Issues. *Journal of Conflict Resolution* 52(1): 117–143.

Research Proposal Due Friday

Week 5: Research Design Choices

Concepts: Matching Theory and Research Design

Ray, James Lee. 2001. Integrating Levels of Analysis in World Politics. *Journal of Theoretical Politics* 13(4): 355–388.

Bennett, D. Scott and Allan C. Stam. 2000. Research Design and Estimator Choices in the Analysis of Interstate Dyads: When Decisions Matter. *Journal of Conflict Resolution* 44(5): 653–685.

Week 6: Domestic Institutions I

Concepts: Democratic Peace, Regression Analysis

Oneal, John R. and Bruce Russett. 1999. The Kantian Peace: The Pacific Benefits of Democracy, Interdependence, and International Organizations, 1885-1992. *World Politics* 52(1): 1–37.

Week 7: Domestic Institutions II

Concepts: Leader Constraints, Causal Mechanisms and Theoretical Implications

Danilovic, Vesna and Joe Clare. 2007. The Kantian Liberal Peace (Revisisted). *American Journal of Political Science* 51(2): 397–414.

Weeks, Jessica L. 2012. Strongmen and Straw Men: Authoritarian Regimes and the Initiation of International Conflict. *American Political Science Review* 106(2): 326–347.

Research Design Due Friday

Week 8: Do Alliances Encourage or Prevent War?

Concepts: Deterrence, Generalized Linear Regression

Leeds, Brett Ashley. 2003. Do Alliances Deter Aggression? The Influence of Military Alliances on the Initiation of Militarized Interstate Disputes. *American Journal of Political Science* 47(3): 427–439.

Gibler, Douglas M. 2008. The Costs of Reneging: Reputation and Alliance Formation. *Journal of Conflict Resolution* 52(3): 426–454.

Week 9: Rationalist Explanations

Concepts: Bargaining Model, Expected Utility

Fearon, James D. 1995. Rationalist Explanations for War. *International Organization* 49(3): 379–414.

Week 10: Lab Day—R Review and Help

Concepts: Refresher on Key Concepts, Computational Tips

Lab Day to Help with Research Paper

Week 11: War Aims and War Outcomes

Concepts: War Outcomes, Selection Effects

Sullivan, Patricia L. 2007. War Aims and War Outcomes: Why Powerful States Lose Limited Wars. *Journal of Conflict Resolution* 51(3): 496–524.

Week 12: Civil War

Concepts: Greed and Grievance, Evaluating Competing Explanations

Fearon, James D. and David D. Laitin. 2003. Ethnicity, Insurgency, and Civil War. *American Political Science Review* 97(1): 75–90.

Chatagnier, J. Tyson, and Emanuele Castelli. 2019. The Arc of Modernization: Economic Structure, Materialism, and the Onset of Civil Conflict. *Political Science Research and Methods* 7(2): 233–252.

Research Paper Due Friday

Course Policies

Student Responsibilities in the Learning Process: Students are expected to complete all required readings prior to class and complete all assessments on time. This means accessing the materials with sufficient time to complete assessments prior to deadlines. In the event that a student has questions concerning the material, they should formulate specific questions to ask via office hours or email with sufficient time for a response prior to assessment deadlines (i.e. questions should be sent at least 24 hours prior to a deadline, excluding weekends).

Classroom Conduct: Students are expected to participate in class in a thoughtful and respectful manner while in the pursuit of knowledge accumulation. Generally, this means engaging with one another's ideas and treating others as one would like to be treated, as well as *not* treating others how one would *not* like to be treated. Please see university policies on freedom of speech and discrimination and harassment.

Grade Appeals: In the event that a student believes that the grade of an assessment is inaccurate, based on the assignment instructions, and would like their assessment re-graded, they may appeal their assignment score. Decisions on appeals are the the discretion of the instructor. To make an appeal, a student must submit a written memo to the instructor explaining the specific discrepancy, and recommend an appropriate recourse (e.g., an appropriate mark in their view) within one week of receiving the graded assignment. Once the instructor receives confirmation of an appeal and the written memo (email is fine), they will open the student's assessment and re-grade the ***entire*** assignment; that is, all aspects of the assessment will be evaluated, not only specific sections or parts. This will then be the new, final score on the assessment; an important caveat is that the score may stay the same, go up, or go down.

Accommodations: Please discuss any special needs with the instructor start of the semester, for example to request reasonable accommodations if an academic requirement conflicts with religious practices and/or observances. Those seeking accommodations based on disabilities should complete the appropriate documentation with Student Life Programs and Services.

Academic Misconduct: All acts of dishonesty in any work constitute academic misconduct; please see the University's guidelines—including ways to avoid inadvertent misconduct—and

rules of procedures regarding misconduct. The Student Disciplinary Regulations will be followed in the event of academic misconduct.

A special note on plagiarism. Plagiarism is the act of representing, directly or indirectly, another person's work as one's own. It can involve presenting someone's speech, wholly or partially, as your own; quoting without acknowledging the true source of the material; copying and handing in another person's work with your name on it; and similar infractions. Even indirect quotations, paraphrasing, etc., can be plagiarism unless sources are properly cited. This is also true of using generative AI; in addition to citing the relevant software, proper attribution to the underlying source materials is also required.

Copyright: Course materials, including recorded lectures and slides, are the instructor's intellectual property covered by the Copyright Act, RSC 1985, c C-42. Course materials posted on Quercus are for registered students only and may not be posted to other websites or media without the express permission of the instructor. Unauthorized reproduction, copying, or use of online recordings constitute copyright infringement.

The instructor reserves the right to modify the syllabus to reflect the pace of the course.