Course Description:
Sociologists and other social scientists are often interested in understanding causal and dynamic social processes such as:

“How do the places we live, work, and play get under the skin and affect health and well-being across the life course?”
“Does upward social class mobility change one’s political attitudes?”
“What social currents are responsible for changes in support for same-sex marriage across historical time?”
“Are long-standing racial inequalities declining, persisting, or increasing in recent years?”

Many of these questions are methodologically difficult to answer with observational (non-experimental) data, and they require that we get a handle on the study of change, context, and causality. You likely have learned how to answer questions like these with standard OLS (linear) regression techniques and cross-sectional data, which remain useful tools in social scientists’ methodological toolbox. But these techniques are also quite limited, and impose strict assumptions that do not allow us to meet many of our goals, adequately answer our questions, or provide stringent tests of our theories and hypotheses.

In this course, we’ll pick up where introductory statistics courses leave off, and get an introduction to more advanced statistical methods for observational data, including but not limited to: regression for categorical dependent variables, fixed and random effects models, and hierarchical linear modeling. This course will be a mix of seminar and lecture, where we will be focused on understanding how we can use these methods to better meet our goals and answer our research questions. Put differently, this course is less focused on going “under the hood” and more focused on “how to drive”—specifically, we will interrogate the assumptions and use of these statistical methods in the social sciences and learn how to implement these methods using STATA. This will include: discussion of core methodological assumptions and limitations, how to apply these statistical methods in different settings, and learning when specific methods are appropriate tools and when they are not. We will explore these issues through student-led discussions, hands-on data analysis, and dissecting the application of these methods in academic journal articles. As part of this course, you will be exposed to (and critique) a wide range of sociological research published in our major disciplinary journals. The course will culminate in an independent research project where students will analyze data and use the one or more of the modeling techniques discussed during the term to answer a sociological research question of their choosing.

SOCY 10 or equivalent and a basic understanding of STATA is required to enroll in this course.
Course Readings

Required Texts
Firebaugh, Glenn. 2008. Seven Rules for Social Research. Princeton: Princeton University Press (note: this is a handy reference that we will use throughout the course, but it is not a statistics textbook).

*We will primarily rely on academic journal articles in this course, available on CANVAS. The full citation of these readings are listed at the end of this syllabus.

Optional Texts:
Basic Statistics (resources for those looking for a refresher on introductory statistics)


STATA Guides (resources for those having trouble with STATA---see the section below for online resources)

A Deeper Dive (an elaboration of the methods discussed this term)

*Additional optional readings (academic journal articles) are available on CANVAS. The full citation of these readings are listed at the end of the syllabus.

For a good application of statistics to everyday life, I highly recommend that you add these blogs to your daily reading:
Family Inequality (Phil Cohen): http://familyinequality.wordpress.com/
Five Thirty Eight (Nate Silver et al.): http://www.fivethirtyeight.com/
Vox (Ezra Klein et al.) www.vox.com
The Upshot (NYTimes) http://www.nytimes.com/upshot/
Wonkblog (WaPo): http://www.washingtonpost.com/blogs/wonkblog/
Statistical Modeling, Causal Inference, Social Science (Andy Gelman) http://andrewgelman.com/
**Statistical Software and Electronics**

We will be using STATA 13.1 for in-class demonstrations, problem sets, and the final project. STATA is available for free on the Dartmouth Network (Mac/PC) and is also available on most public computers on campus. If you are off campus, you can use Dartmouth’s VPN to access the keyserve. For more information on STATA resources and installing STATA on your computer, see the following websites:

http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/software

MAC: http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/stata-macintosh-os-x

PC: http://tech.dartmouth.edu/its/services-support/help-yourself/knowledge-base/stata-windows

Please use these resources and the helpdesk for any installation questions.

In most classes, we will be using STATA in order to demonstrate statistical techniques. This reason, you are encouraged to bring your laptop to class to every class period.

A brief note on STATA: Becoming proficient in a programming language is **hard**. I will periodically provide STATA refreshers during Xhours, and we will learn/practice new STATA commands during regular class periods. However, I highly recommend that you practice outside of class to hone your skills. Please see me during office hours with all STATA related questions. In addition, here are some resources that will help you as you learn to code in STATA:

**STATA Resources**
Jianjun Hua’s research guides
http://researchguides.dartmouth.edu/content.php?pid=316205&sid=2587562

UCLA Stata Resources
http://www.ats.ucla.edu/stat/stata/

Princeton Stata Resources:
http://data.princeton.edu/stata/
http://dss.princeton.edu/training/StataTutorial.pdf
http://dss.princeton.edu/online_help/stats_packages/stata/

You will also need to have a **calculator** to complete your assignments and exams, and to participate in in-class exercises. A basic and inexpensive calculator that has square-root and squaring functions is best for use in this class.
Evaluation and Grading

Student Mini-Conferences (10%) On the last day of each unit, one student will be responsible for presenting the findings of one of the optional readings from the unit (listed at the end of this syllabus) to the class for 20 minutes max. Students can select any of the optional readings listed in bold at the end of the syllabus for each respective unit. Alternatively, students are also welcome to present on an alternative reading/study, provided that I approve it in advance. Your goal in these mini-conferences is to present the main points of one of the optional readings to the class (which your classmates will not have read). As part of these mini conferences, groups should focus on: 1) communicating the main points of the reading to the audience (what is the author asking/arguing? Why is this important?); 2) reflecting on how this article builds on/complicates/challenges what we have learned so far in this unit (and perhaps other units); 3) discuss the strengths and limitations of the use of the statistical method; and 4) the implications for future research. When presenting, keep in mind that you are effectively teaching new material to your fellow classmates, who will not have read the piece you selected for the day.

Homework (15%): There will be several homework assignments throughout the term. Assignments will typically be due at the beginning of class Monday unless otherwise specified. For all homework assignments, you will need to turn in STATA output (LOG and Do files). If you do not do so, you will lose a great deal of points. For most of these assignments you will use STATA. Students are welcome to work together and help each other on assignments, but each student MUST turn in their own assignment and provide answers in their own words. Assignments will be posted on Canvas by Monday of the week before they are due (at the latest). Please post any questions about the assignments to the “Homework Discussions” forum on Canvas. I will be checking this forum occasionally, but its primary purpose is to provide you a place to help one another understand the material.

In-class activities and lab assignments (10%): Many class sessions will include in-class activities (either discussion based or lab based), in which students will work together to solve an empirical problem and/or dig into the assumptions of the methods that are being discussed that day. These group activities are crucial to the success of the course, and therefore your participation in these activities is important. These in-class assignments will be handed in at the end of the class period and graded on the check system (✓+ [exemplary], ✓ [average/adequate], ✓- [not sufficient]). You can only get credit for the assignments if you are present on the day of class. For this reason, I will drop the two lowest activity grades. In essence, each student has two freebies.

Class Participation (5%): Although I will lecture during this course, much of the class will revolve around STATA labs and our discussion of the methods and the application of these methods. Thus, class participation is imperative to the success of this class. What does class participation entail? It means you must be an active participant in the class. This includes: 1) contributing to class discussion; 2) actively contributing to small group exercises and lab. if you come into class, sit quietly every day, and do not contribute to class discussion you will receive a 0 for class participation. Note that this grade is separate from your in-class lab assignment grade.

Final Research Paper (60%) For the final writing assignment, you will write a standard sociological research paper—modeled on the academic articles we read this term—one the topic or question of your
choice. You will draw on secondary literature (at least seven academic sociological research articles) to address your research questions. You will conduct an original data analysis using one or more of the methods discussed in this course to answer your research question. More detailed instructions will follow. This paper will be completed in a series of steps, and you will receive feedback and review from myself and your classmates at each stage:

1) 1/2-page research proposal (5%): Your research proposal must include your research question, a testable hypothesis, and a description of the data and methods you plan to use to address/answer your research question. **Due Fri 9/29**
2) Data Analysis I (5%): **Due Mon 10/16**
3) Data Analysis II (5%): **Due Mon 10/27**
4) Presentation of Research Project (15%) (To be scheduled during final week of class)*
5) Final Draft (30%) **Due Mon 11/20**

*attendance is required for all final presentation dates

I will use the following scale in assigning final grades:

95%-100%: A 83%-88.9%: B 73%-76.9%: C Below 60%: F
92%-94.9% A- 80%-82.9% B- 70%-72.9% C-
89%-91.9%: B+ 77%-79.9%: C+ 60%-69.9%: D

Please note the following about grades: 1) I base my grades on the Dartmouth Scholarship ratings ([http://www.dartmouth.edu/~reg/transcript/grade_descriptions.html](http://www.dartmouth.edu/~reg/transcript/grade_descriptions.html)) 2) I do not round grades; 3) I do not negotiate final grades unless an error was made.

One final note: To receive full credit on homework assignments and exams, you must show your work. If you write down the answer without showing how you got to that answer, even if that answer is correct, you will not receive full credit.

**Attendance Policy**

As a general rule, I do not believe in attendance policies for college-aged students. If you must miss class, you do not need to provide me with an explanation. More importantly, do not ask whether you missed anything important (if the material you missed wasn’t important, it wouldn’t have been covered in class). Do not ask me for lecture notes—ask your classmates. I will assume that you are serious about your commitment to this class. As such, I presume that if you miss class you have a good reason (e.g., you are very sick, you are caring for someone who is very sick, or you are trapped under something very heavy). Two exceptions: 1) If your absences become chronic, or if you anticipate chronic absences, then it’s time to consult with me; 2) your attendance is required for group presentation days.
All that said, if you blow off class and do so on a regular basis, you will likely fall behind and find it very difficult to catch up. You will also not receive credit for in-class activities. Fair warning: if this happens, I am unlikely to sympathize with your plight.

**Late Policy**

On any assignment, your grade will be reduced by 8 percentage points for each day late (e.g., 1 day late a grade of 100 would be reduced to a 92; 2 days, 84; and so on). Assignments that are more than 5 days late will not be not be graded and will receive a 0. Given that assignments are posted far in advance, no exceptions to the late policy will be made, including for planned and unplanned absences.

**Academic Integrity**

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner and all members of the Dartmouth community are expected to act in accordance with this principle. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the Dartmouth community and compromise the worth of work completed by others. As such, dishonesty of any kind will not be tolerated and students found in violation of the Dartmouth Academic Honor Principle will be notified and reported to the appropriate authorities (http://student-affairs.dartmouth.edu/policy/academic-honor-principle). Cheating and other forms of dishonesty (such as plagiarizing) often result when students feel too much pressure to perform and that they do not have the tools to achieve their goals. If you are falling behind or feeling overwhelmed, please come sit down and chat with me BEFORE you decide to cheat. For additional resources on the Academic Honor Code, plagiarizing, and proper citation of sources, please see the following link: http://writing-speech.dartmouth.edu/learning/materials/sources-and-citations-dartmouth

**Disability Needs**

Students with disabilities who may need disability-related academic adjustments and services for this course are encouraged to see me privately as early in the term as possible. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services office (Carson Hall, Suite 125, 646-9900). Once SAS has authorized services, students must show the originally signed SAS Services and Consent Form and/or a letter on SAS letterhead to me. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential, but please note that the Student Disabilities Coordinator may be consulted to verify the disability. See http://www.dartmouth.edu/~accessibility/ for more information.
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<td>W 9/13</td>
<td>Regression: Review and Expansion I</td>
<td>Firebaugh, Ch 1.</td>
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<td>Th 9/14</td>
<td>X hour: STATA Basics (Optional)</td>
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<td>F 9/15</td>
<td>Regression: Review and Expansion II</td>
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<td>M 9/18</td>
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<td>Firebaugh, Ch 3.</td>
<td>Mini Conference #1; HW 1 Due</td>
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<td>STATA Workshop: Advanced Workflow Techniques</td>
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<tr>
<td>F 9/22</td>
<td>Regression for Categorical DV’s I</td>
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<tr>
<td>M 9/25</td>
<td>Regression for Categorical DV’s II</td>
<td>Uggen and Manza 2002</td>
<td>HW 2 Due</td>
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<td>W 9/27</td>
<td>Regression for Categorical DV’s III</td>
<td>McLaughlin et al. 2012</td>
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<td>Th 9/28</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<td>F 9/29</td>
<td>Regression for Categorical DV’s IV</td>
<td>Ryder 1965; Firebaugh and Haynie 1997</td>
<td>Mini Conference #2; Research Proposal Due</td>
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<td>M 10/2</td>
<td>An Introduction to the Study of Change I</td>
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<td>W 10/4</td>
<td>An Introduction to the Study of Change II</td>
<td>Firebaugh Ch. 5-6</td>
<td>Mini Conference #3</td>
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<td>Th 10/5</td>
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<td>F 10/6</td>
<td>Fixed and Random Effects I</td>
<td>Johnson 1995</td>
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<td>M 10/9</td>
<td>Fixed and Random Effects II</td>
<td>Berger and Houle 2016</td>
<td>HW 4 Due</td>
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<td>W 10/11</td>
<td>Fixed and Random Effects III</td>
<td>Colen &amp; Ramey 2014</td>
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<td>Th 10/12</td>
<td>HLM I</td>
<td>Denney 2015 -OR- Ross and Mirowsky 2001</td>
<td>Data Analysis I due</td>
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<td>F 10/13</td>
<td><em><strong>NO CLASS: Meet Thursday X Hour</strong></em>*</td>
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<td>M 10/16</td>
<td>HLM II</td>
<td>Houle and Berger 2017</td>
<td>HW 5 Due</td>
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<td>W 10/18</td>
<td>HLM III</td>
<td>Hook 2010</td>
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<td>Th 10/19</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<td>F 10/20</td>
<td>Event History I</td>
<td>Greenman and Hall</td>
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<td>M 10/23</td>
<td>Event History II</td>
<td>Link et al.</td>
<td>HW 6 Due</td>
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<td>W 10/25</td>
<td>Event History III</td>
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<td>Mini Conference #6</td>
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<td>Th 10/26</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<td>F 10/27</td>
<td>Natural/Quasi Experiments and Instrumental Variables I</td>
<td>Firebaugh, Ch 7.; Kirk 2009</td>
<td>Data Analysis II due</td>
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<tr>
<td>M 10/30</td>
<td>Natural/Quasi Experiments and Instrumental Variables II</td>
<td>Light and Iceland 2016</td>
<td>Mini Conference #7; HW 7 Due</td>
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<td>W 11/1</td>
<td>Much Ado About Missing Data I</td>
<td>Johnson and Young 2011; Acock 2005</td>
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<td>Th 11/2</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<td>F 11/3</td>
<td>Much Ado About Missing Data II</td>
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<td>Mini Conference #8</td>
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<td>M 11/6</td>
<td>Advanced Topics: The Identification Problem in Sociology and Demography*</td>
<td>Houle 2011</td>
<td>HW 8 Due</td>
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<td>Th 11/9</td>
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<td>F 11/10</td>
<td>Final Presentations</td>
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<td>M 11/13</td>
<td>Final Presentations</td>
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**FINAL PAPER DUE VIA EMAIL BY MONDAY, NOVEMBER 20, 11:59 PM**

NOTE: *if time permits*
**Required Chapters and Articles by Unit**

*In addition to the Firebaugh book (7 Rules), we will also be reading and discussing a range of academic articles and chapters, noted above in the tentative course schedule. These articles are available on CANVAS, and the full citations are below:*

**Unit 1: A Review and Expansion of Regression**

**Unit 2: Regression for Categorical DV’s**

**Unit 3: An Introduction to the Study of Social Change**

**Unit 4: Fixed and Random Effects**

**Unit 5: HLM**
Unit 6: Event History

Unit 7: Natural Experiments and Instrumental Variables

Unit 8: Missing Data

Unit 9: The Identification Problem

OPTIONAL READINGS BY UNIT (readings in bold may be used for your mini conferences. The remaining readings are for your own edification)

Unit 1: A Review and Expansion of Regression (Mini Conference 1)

Addo, Fenaba, Jason Houle and Daniel Simon. 2016. “Young, Black, and (Still) in the Red; Parental Wealth, Race, and Student Loan Debt.” *Race and Social Problems* 8:64-76.


Houle, Jason. 2014. “Disparities in Debt: Parents’ Socioeconomic Resources and Young Adult Student Loan Debt.” *Sociology of Education* (note: a bonus to whomever finds the error embedded in the results section of this paper)


Unit 2: Regression for Categorical DV’s (Mini Conference 2)

Barkan, Steven, Michael Roque and Jason Houle. 2013 “State and Regional Suicide Rates: A New Look at an Old Puzzle.” *Sociological Perspectives* 56:287-297.


Houle, Jason and Lawrence Berger. 2015. “Is Student Loan Debt Discouraging Home Buying Among Young Adults?” 89:589-621.


Mood, Carina. 2009. “Logistic Regression: Why We Cannot Do What We Think We Can Do, And What We Can Do About it.” *European Sociological Review* 26:67-82.


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**Unit 3: An Introduction to the Study of Social Change (Mini Conference 3)**


Unit 4: Fixed and Random Effects (Mini Conference 4)


Hier

Unit 5: HLM (Mini Conference 5)


Unit 6: Event History (Mini Conference 6)

Denney, Justin, Richard Rogers, Patrick Krueger, and Tim Wadsworth. 2009. “Adult
Suicide Mortality in the United States: Marital Status, Family Size, Socioeconomic Status, and Differences by Sex.” *Social Science Quarterly* 90:1167-1185.


Unit 7: Natural Experiments and Instrumental Variables (Mini Conference 7)


Houle, Jason, J. Michael Collins, and Max Schmeiser. 2015. “Flu and Finances: Influenza...
Outbreaks and Loan Defaults in U.S. Cities.” *American journal of Public Health* 105:e75-e80.


Unit 8: Missing Data (Mini Conference 8)


Unit 9: The Identification Problem (Mini Conference 9)


