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/](http://familyinequality.wordpress.com/)
Five Thirty Eight (Nate Silver et al.): [http://www.fivethirtyeight.com/](http://www.fivethirtyeight.com/)
Vox (Ezra Klein et al.) [www.vox.com](http://www.vox.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. Make sure to bring your calculator to class every day and to all exams. You are not permitted to use cell phone calculators for exams, but you are welcome to use them during regular class periods.
Evaluation and Grading

Student Mini-Conferences (10%) On the last day of each unit, a group of 2-4 students 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 on 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—on 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 1/19**
2) Data Analysis I (5%): **Due Fri 2/2**
3) Data Analysis II (5%): **Due Fri 2/16**
4) Presentation of Research Project (15%) **(To be scheduled during final week of class)**
5) Final Draft (30%) **Due Sun 3/11**

*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 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 Honor Code will be notified and reported to the appropriate authorities. 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.

**Disability Needs**

Any student with a disability-related need for modifications or reasonable accommodations in this course must let me know as soon as early in the term as possible and contact the Student Disabilities Coordinator. I will keep this information strictly 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.
## TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Class</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignment Due Dates</th>
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<tbody>
<tr>
<td>W 1/3</td>
<td>Course Introduction</td>
<td>Wheelan Ch 11-12</td>
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<tr>
<td>Th 1/4</td>
<td>X hour: STATA Basics (Optional)</td>
<td>Firebaugh, Ch 1.</td>
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<tr>
<td>F 1/5</td>
<td>Regression: Review and Expansion I</td>
<td>Firebaugh, Ch 2;</td>
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<tr>
<td>M 1/8</td>
<td>Regression: Review and Expansion II</td>
<td>Stack and Gundlach 1992</td>
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<tr>
<td>W 1/10</td>
<td>Regression: Review and Expansion III</td>
<td>Firebaugh, Ch 3.</td>
<td>Mini Conference #1</td>
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<tr>
<td>Th 1/11</td>
<td>X hour: STATA Basics (Optional)</td>
<td>Firebaugh, Ch 4; Harris and Sim</td>
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<tr>
<td>F 1/12</td>
<td>Regression for Categorical DV’s I</td>
<td></td>
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<tr>
<td>M 1/15</td>
<td>No class, MLK Day (class held @ 1/18 X hour)</td>
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<tr>
<td>W 1/17</td>
<td>Regression for Categorical DV’s II</td>
<td>Uggen and Manza 2002</td>
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<tr>
<td>Th 1/18</td>
<td>Regression for Categorical DV’s III</td>
<td>McLaughlin et al. 2012</td>
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<tr>
<td>F 1/19</td>
<td>Regression for Categorical DV’s IV</td>
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<td>Mini Conference #2; Research Proposal Due</td>
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<tr>
<td>M 1/22</td>
<td>An Introduction to the Study of Change I</td>
<td>Ryder 1965; Firebaugh and Haynie 1997</td>
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<tr>
<td>W 1/24</td>
<td>An Introduction to the Study of Change II</td>
<td>Firebaugh Ch. 6;</td>
<td>Mini Conference #3</td>
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<tr>
<td>Th 1/25</td>
<td>X Hour: Final Project Lab (Optional)</td>
<td>Firebaugh, Ch. 5</td>
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<tr>
<td>F 1/26</td>
<td>Fixed and Random Effects I</td>
<td>Johnson 1995</td>
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<tr>
<td>M 1/29</td>
<td>Fixed and Random Effects II</td>
<td>Berger and Houle 2016</td>
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<tr>
<td>W 1/31</td>
<td>Fixed and Random Effects III</td>
<td>Colen &amp; Ramey 2014</td>
<td>Mini Conference #4</td>
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<tr>
<td>Th 2/1</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<tr>
<td>F 2/2</td>
<td>HLM I</td>
<td>Denney 2015 -OR- Ross and Mirowsky 2001</td>
<td>Data Analysis I due</td>
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<tr>
<td>M 2/5</td>
<td>HLM II</td>
<td>Houle and Berger 2017</td>
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<tr>
<td>W 2/7</td>
<td>HLM III</td>
<td>Hook 2010</td>
<td>Mini Conference #5</td>
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<tr>
<td>F 2/9</td>
<td>Event History I</td>
<td>Greenman and Hall</td>
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<tr>
<td>Date</td>
<td>Event</td>
<td>Author(s)</td>
<td>Notes</td>
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<tr>
<td>M 2/12</td>
<td>Event History II</td>
<td>Link et al.</td>
<td>Mini Conference #6</td>
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<tr>
<td>W 2/14</td>
<td>Event History III</td>
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<tr>
<td>Th 2/15</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<tr>
<td>F 2/16</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 2/19</td>
<td>Natural/Quasi Experiments and Instrumental Variables II</td>
<td>Light and Iceland 2016</td>
<td>Mini Conference #7</td>
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<tr>
<td>W 2/21</td>
<td>Much Ado About Missing Data I</td>
<td>Johnson and Young 2011; Acock 2005</td>
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<tr>
<td>Th 2/22</td>
<td>X Hour: Final Project Lab (Optional)</td>
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<tr>
<td>F 2/23</td>
<td>Much Ado About Missing Data II</td>
<td></td>
<td>Mini Conference #8</td>
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<tr>
<td>M 2/26</td>
<td>Advanced Topics: The Identification Problem in Sociology and Demography*</td>
<td>Houle 2011</td>
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<tr>
<td>Th 3/1</td>
<td>X Hour: Final Project Lab (Optional) or Final Presentations</td>
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<tr>
<td>F 3/2</td>
<td>Final Presentations</td>
<td></td>
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<tr>
<td>M 3/6</td>
<td>Final Presentations</td>
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</table>

**Final Paper Due Via Email by Sunday, March 11, 11:59 PM**

Note: *if time permits*
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. 2013. “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)

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


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

Branigan, Amelia R. et al. 2013. “Skin Color, Sex, and Educational Attainment in the Post-
Civil Rights Era.” Social Science Research 42:1659-1674.
Dixon, Marc and Andrew Martin. 2012. “We Can’t Win This On Our Own: Unions, Firms,
Dwyer, Rachel, Laura McCloud, and Randy Hodson. 2012. “Debt and Graduation from
American Universities.” Social Forces 90:1133-1155.
Frisco, Michelle, Jason Houle, and Adam Lippert. 2013. “Weight Change and Depression
Among US Young Women During the Transition to Adulthood.” American Journal of
Epidemiology 178:22-30.
and Nonstandard Employment Relations and Job Quality in the United States.” American
Sociological Review 65:256-278.
Kubrin, Charis, Tim Wadsworth, and Stephanie DiPietro. 2006. “Deindustrialization,
Disadvantage and Suicide Among Young Black Males.” Social Forces 84:1559-1579.
Link, Bruce G et al. 2016. “Disparities in Self-Rated Health Across Generations and
Through the Life Course.” Social Science and Medicine, forthcoming.
Maroto, Michelle. 2016. “Growing Farther Apart: Racial and Ethnic Inequality in
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.
Pager, Devah. 2016. “Are Firms that Discriminate More Likely to Go Out of Business?”
Smith, Brad and Malcolm Holmes. 2014. “Police Use of Excessive Force in Minority
Communities: A Test of the Minority Threat, Place, and Community Accountability
Association? The Mental Health of Mothers with Children by Recently Incarcerated

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

Amato, Paul R, David R Johnson, Alan Booth, and Stacy Rogers. 2003. “Continuity and
Change in Marital Quality Between 1980 and 2000.” Journal of Marriage and Family 65:1-
22.


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


Houle, Jason. 2014. “Mental Health in the Foreclosure Crisis.” *Social Science & Medicine*


**Unit 6: Event History (Mini Conference 6)**


South, Scott J and Lei Lei. 2015. “Failures-to-Launch and Boomerang Kids:
Contemporary Determinants of Leaving and Returning to the Parental Home.” *Social Forces* 94:863-890.


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

**Andersen, Signe Hald, and Christopher Wildeman. 2014. “The Effect of Paternal Incarceration on Children’s Risk of Foster Care Placement.” *Social Forces* 93:296-298.**


Unit 8: Missing Data (Mini Conference 8)


Unit 9: The Identification Problem (Mini Conference 9)


