CRACKING THE CODE: UNDERSTANDING RESEARCH IN EDUCATION AND SOCIAL POLICY

APSTAT-UE 21-001
Course Syllabus – Spring 2018

Professors:
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Office hours: Monday 1-3 pm

Tuesday & Thursday 11:00 – 12:15
Location TBD

Course description
Aimed at students who expect to read and interpret, rather than conduct, statistical analyses, this course is designed to help students become better and more critical consumers of quantitative evidence. Using research studies discussed in the popular media and focused on currently debated questions in education and social policy, the course covers key concepts in quantitative reasoning, basic statistics, and research design. Research readings will focus on topical issues regarding early childhood and K-12 education and other social policy issues that affect children and youth.

While statistics and research results are commonly used as evidence in the discussion of critical social problems and interventions to address them, the quality of that evidence varies widely. In this environment, an ability to understand and critically assess quantitative evidence is an essential skill of an informed citizen. Further, the ability to read and make sense out of scientific research is important to those who want to make social change and advocate for improved social policy in their communities. This course will prepare you to make such assessments. While we will not focus on data analysis, students will be expected to learn the value and meaning of basic statistical procedures and become able to read study reports with a critical eye.

NOTE: This course cannot be taken if you have already taken FOOD: UE 1115: Cracking the Code: Understanding Research in Health and Development

Course objectives
Upon completion of this course, students will be able to:
• Identify the critical aspects of scientific inquiry and assess scientific evidence as it pertains to the social sciences and policy debates in health and human development.
• Describe populations and phenomena with statistics, including measures of central tendency and dispersion. Students will understand why different measures are appropriate to different questions, and how the use of different measures may lead to different conclusions.
• Display data in graphs and tables and understand how such data displays may persuade or mislead users of these data.
• Assess the quality of samples used in reported research. Recognize different sampling techniques and be able to critically assess the generalizability of study result based on the study sample.
• Interpret the meaning of a confidence interval. Understand Type 1 and Type 2 errors and the trade-offs between them.
• Identify measures of association and correlation and know how to interpret them.
• Distinguish correlation from causation and assess threats to internal validity.
• Identify and describe key features of common research designs including polling, random assignment experiments, panel studies, natural experiments, and quasi-experimental designs used in evaluation research. Students will be able to describe the strengths and weaknesses of different approaches.
• Consider quantitative evidence in light of other empirical evidence and studies of a qualitative nature.
• Identify ethical issues in the study of social phenomenon and the people they affect.

**Prerequisites**
There are no prerequisites for this course.

**Course readings**
Two books are required and have been ordered by the NYU Bookstore.


Additional articles and book chapters will be available on NYU Classes. These will be assigned throughout the semester and assignments are noted in the course schedule below.

As an additional resource, students may wish to use [http://stattrek.com/](http://stattrek.com/). Sections of this site are assigned for two of our class sessions but this “teach yourself” statistics website may also be useful to students who want a more detailed understanding of statistical tests and underlying principles than provided in the course readings.

Students may find the following good sources for locating relevant and interesting articles for homework assignments:
“Education” section of the NY Times
NPR’s “Education” podcasts ([http://www.npr.org/sections/education/](http://www.npr.org/sections/education/))
Education Week ([www.edweek.org](http://www.edweek.org))
Education Next ([www.educationnext.org/](http://www.educationnext.org/))
Course requirements

Your grade will be determined as follows:

- Class attendance/participation: 10%
- Weekly homework assignments: 20%
- Brief paper: 30%
- Final Exam: 40%

Description of course assignments

Class attendance/participation: Coming to class regularly and prepared is essential. In-class lectures, exercises, and discussions are intended to reinforce and extend concepts presented in the readings. Students should come to class having done the assigned readings for each week as listed in the course outline. Students should inform the professors via email of any expected absences. If a class is missed, students are expected to hand-in a 1-2 page summary of the readings for that missed class. That summary must be turned in no later than the next class session. The overall grade for class attendance and participation will be based on the consistency and quality of student engagement.

Weekly homework assignments: There are 10 brief homework assignments over the course of the semester. These assignments will help you learn how to find, read, and assess research articles and become more adept at critiquing the presentation of research in the popular press. All homework must be completed and submitted on time.

They will be graded on a three point scale: 1 is below expectations; 2 is at expectations; and 3 is above expectations. The total scores will be added together for the final grade on this portion. Students who receive more than 26 points will receive a grade of A; 24-26 points an A-, 20 – 24 points a B+, and 16-18 points a B. Students who score less than 18 points will receive a C for this portion of their grade.

Brief Paper: Due Week 7

Using the Youth Risk Behavioral Survey (YRBS)

- A brief description the data (what is who is sampled? How are they sampled?),
- An overview of the kinds of questions that are asked in the dataset
- A summary of key findings about the two questions of your choosing
- Point estimates and confidence intervals (and describe their meaning) for your questions,
- The results of t-tests for your two hypotheses, and
- Caveats or limitations that the reader should know about the data

Papers will be graded for accuracy, as well as the quality of organization and writing. Briefs that accurately answer all of the questions listed above, are clearly presented and well-organized will receive a grade of A. Students whose work is accurate but where writing is weak or poorly organized will receive a grade of B. Students whose work is
consistently inaccurate or poorly written will receive a grade of C. Students whose work is consistently inaccurate and poorly written risk receiving a failing grade.

Final Exam: Immediately following the last class of the semester a popular press article with two relevant research articles will be uploaded to NYU Classes. Students should carefully read and review all of these materials prior to coming to the final exam and bring these materials with them to the exam, along with any notes of their own. (Other books, articles etc., will not be permitted) During the exam period, students will be asked to answer a series of factual and interpretative questions about the readings and to make comparisons and judgments. The exam is intended to allow the student to demonstrate a meaningfully grasp of key concepts covered throughout the course of the semester and to use them in analyzing research studies. The grading schema for the exam (that is, points per question) will be clearly noted.
Other class information

Office Hours and Email: Professor Weinstein has set aside 90 minutes each week to meet with students. Students are encouraged to come speak with either one or both about the course and their class performance, as well as about other matters related to their academic and career goals. Students who are unable to meet during office hours may email for an appointment at another mutually convenient time. Students can expect, in general, to receive a response to any email within 24 hours. Please note, we will not respond to your email over the weekend except in true emergencies.

NYU Classes: All materials pertaining to this course (lecture notes, additional readings, etc.) will be made available on NYU Classes. Enrollment in the course should automatically give you access to the site. Check frequently for new materials and announcements.

Absences: Please contact the professor immediately if you have any conflicts with the scheduled assignments, or anticipate being absent for any reason. Additionally, students should inform the professors, whenever possible, of expected lateness or the need to leave early. Because this class is being co-taught, we have included a schedule of which professor will be teaching each week for you to contact. Frequent problems with absence, lateness, or early departure can result in a lowered class participation grade.

Class etiquette: Turn off and put away your cell phones and other electronic devices while in class. Students who wish to use their computers for notetaking should know that the use of their computers for any other purpose during class time will result in the loss of that privilege (that is, in-class use of their computer) for the remainder of the semester.

All students regardless of gender, age, class, race, religion, physical disability, sexual orientation, gender identity, or native language shall have equal opportunity without harassment in this course. Any problems with or questions about harassment can be discussed confidentially with the professors.

Academic integrity: NYU Steinhardt policies on academic integrity will be strictly enforced in this class. You can find the school’s official statement on academic integrity here (http://steinhardt.nyu.edu/policies/academic_integrity).

This means that all work submitted is the original work of the student whose name appears on it and that the work was prepared originally for this course. All notes and materials gathered for graded work, including homework, should be kept and must be made available to the professor upon request. All such material will be returned to you following the evaluation of papers and reports.

Academic dishonesty includes cheating, plagiarism, unauthorized collaboration, falsifying academic records, and any act designed to avoid participating honestly in the learning process. Academic dishonesty also includes, but is not limited to, providing false or misleading information to receive a postponement or an extension on a homework, paper,
or exam and submission of essentially the same written assignment or oral presentation for two courses without my prior permission.

By remaining enrolled in this course, you have agreed to these guidelines and must adhere to them. Academic dishonesty damages both your learning experience and readiness for the future demands of a work career. Academic dishonesty will not be condoned and will result in a failing grade for the assignment in question and an automatic report to the Dean’s office. Academic dishonesty is also grounds for failure in the course and prosecution on academic dishonesty charges, which may result in suspension or expulsion from NYU. Students are expected to review and abide by the policy on academic honesty detailed in the New York University Student Handbook; those with questions should consult the professors.

Withdrawal: If you wish to withdraw from the course, please do so formally with the University Registrar. If you withdraw without authorization, you are at risk for receiving a failing grade for the course.

Accommodations: Any student requiring an accommodation due to a chronic psychological, visual, mobility, or learning disability, or who is deaf or hard of hearing, should register with and consult with the Moses Center for Students with Disabilities at 212.998.4980, 726 Broadway, 2nd Floor (www.nyu.edu/csd).
### Course Schedule:
**Understanding Research in Education and Social Policy**

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<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Jan 23 &amp; 25</td>
<td>What is research? Why do we conduct research?</td>
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<tr>
<td>Week 2</td>
<td>Jan 30 and Feb 1</td>
<td>The scientific approach</td>
<td>Homework Exercise #1 due</td>
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<tr>
<td>Week 3</td>
<td>February 6 &amp; 8</td>
<td>Reading a research report</td>
<td>Homework Exercise #2 due</td>
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<td>Week 4</td>
<td>Feb 13 &amp; 15</td>
<td>Reading a research report</td>
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<td>Week 5</td>
<td>Feb 20 &amp; 22</td>
<td>Descriptive and predictive statistics</td>
<td>Homework Exercise #3 due</td>
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<tr>
<td>Week 6</td>
<td>Feb 27 &amp; Mar 1</td>
<td>Descriptive and predictive statistics</td>
<td>Homework Exercise #4 due</td>
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<tr>
<td>Week 7</td>
<td>March 6 &amp; 8</td>
<td>Sampling and sampling distributions</td>
<td>Brief paper due</td>
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<td><strong>March 12-16: NO CLASS: SPRING BREAK!!</strong></td>
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<td>Week 8</td>
<td>March 20 &amp; 22</td>
<td>Survey research</td>
<td>Homework Exercise #5 due</td>
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<td>Week 9</td>
<td>March 27 &amp; 29</td>
<td>Measurement</td>
<td>Homework Exercise #6 due</td>
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<td>Week 10</td>
<td>Apr 3 &amp; 5</td>
<td>Experimental research</td>
<td>Homework Exercise #7 due</td>
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<td>Week 11</td>
<td>April 10 &amp; 12</td>
<td>Quasi-experimental designs</td>
<td>Homework Exercise #8 due</td>
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<td>Week 12</td>
<td>Apr 17 &amp; 19</td>
<td>Evaluation research</td>
<td>Homework Exercise #9 due</td>
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<td>Week 13</td>
<td>Apr 24 &amp; 26</td>
<td>Qualitative and mixed methods</td>
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<td>Week 14</td>
<td>May 1 &amp; 3: Review, catch-up, and preparation for final exam</td>
<td>Homework Exercise #10 due</td>
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<td>Week 15</td>
<td>FINAL EXAM</td>
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Course Outline: Understanding Research in Education and Social Policy

WEEK 1: What is research? Why do we conduct research?
Competing philosophies of “knowing.” Using Research for Exploration, Description, Prediction, or Explanation. Contents of research articles and how to locate them.

   Dane, Chapter 1

Homework Exercise #1: Dane, Chapter 1, Question 3

WEEK 2: The scientific approach
What is the scientific method and how does it differ from other ways of “knowing”? What qualifies as evidence? What are the ethical principles guiding scientific research? What does “social construction” mean in regard to social problems and scientific inquiry about them?

   Dane, Chapter 2
   Best, Chapters 1 and 2


Homework Exercise #2: Dane, Chapter 2, Questions 3 and 4

WEEKS 3 and 4: Reading a research report
How does one locate and identify scientific reports? Understanding the key components of a research report. Using the NYU Library. Using relevant databases (such as PubMed, Web of Science, ERIC).

   Dane, Chapter 3
   Best, Chapters 1 and 2

Case Study 1: TBD

Homework Exercise #3: Dane, Chapter 3, Q. 2 and 4

WEEKS 5: Descriptive and Predictive Statistics
In class exercises to underscore basic approaches to and concepts in statistics

**Week 5:** Prior to week 5, estimate the (1) number of hours spent on homework, (2) number of minutes spent watching TV, and (2) the number of hours of sleep on two selected dates.

We will use these data in a Stata file in class to calculate basic statistical tests.

*Homework Exercise #4: Dane, Chapter 4, Q. 2 and 3*

**WEEKS 6: Using the Youth Risk Behavior Survey (YRBS) to demonstrate statistical concepts**

What is YRBS? How do researchers use these data? How can the public make use of the data that is readily provided? Watch: A videoed lecture available on NYU Classes prior to our class meeting. It may be helpful to view the video prior to reviewing the YRBS website.

Remember, YRBS data will be focus of the paper due **March 9**.

Read: Review the web-based material for the Youth Risk Behavior Survey including:

- [http://www.cdc.gov/healthyyouth/data/yrbs/index.htm](http://www.cdc.gov/healthyyouth/data/yrbs/index.htm)
- [http://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf](http://www.cdc.gov/mmwr/pdf/ss/ss6304.pdf)

**WEEK 7: Sampling and Sampling Distributions**

The difference between populations and samples. Why we sample. Different methods for constructing a sample, key concepts in sampling including normal distributions. External reliability and generalizability. Sample size. Type 1 and Type 2 error and their tradeoffs. Confidence Intervals.

Dane, Chapter 4

Best, Chapter 3

In class exercises to underscore basic approaches to and concepts in statistics

We will use the data from Week 5 to examine differences in populations and samples.

Homework Exercise #5: State three important aspects of the sample used in ECLS-K. These may include the type of sampling method, the sample size, the response rate, etc.

WEEK 8: Survey Research


Dane, Chapter 11

https://www.cdc.gov/healthyschools/shi/index.htm?s_cid=hy-tools-001

Homework Exercise #5: Dane, Question 1 (popular press article that reports on results of survey research. For each variable determine whether it can best be considered fact, opinion, or behavior.)

Case Study 2: TBD

Homework Exercise #6: Dane, Question 1

WEEK 9: Measurement


Dane, Chapter 5

Best, Chapter 4

Review measures in YRBS

Homework Exercise #7: Identify a topic that you would like to explore through a survey. Go to https://www.surveymonkey.com/home/ and design a small survey of 3 questions (these questions may come from their question bank or other studies you have seen). Are these categorical, ordinal or continuous measures. Identify/create a different way that one of your constructs could have been measured using a different level of measurement.
WEEK 10: Experimental Research
Moving from association to causation – what is needed and when is it appropriate?
Concept of internal validity and threats of validity. Rival hypotheses. Random Assignment
Experiments – their requirements, their value, and their limitations. Meta-Analyses.

Dane, Chapter 6

Case Study 3: Do Incentives Matter for Student Achievement?

Homework Exercise #8: Dane, Chapter 7, Questions 1 and 2

WEEK 11: Quasi-Experimental Designs
Examples of key quasi-experimental designs including time series, regression discontinuity
and comparison group designs.

Dane, Chapter 7

Homework exercise #9: Describe three social problems or phenomenon that would be difficult
to explore in a random assignment experiment. What is the source of the difficulty? For one
of these problems, identify how a quasi-experimental design might instead be used?

WEEK 12: Evaluation Research
Formative vs. summative evaluations. Use of experiments and quasi-experiments to assess
impact of programs and policies. Natural Experiments. Role of research in policy debate.

Dane, Chapter 12

http://epa.sagepub.com/content/early/2014/12/04/0162373714559096.full.pdf+
html?ijkey=rro4HwVYfleHc&keytype=ref&siteid=spepa

Case Study 4: TBD

WEEK 13: Qualitative and Mixed-Methods research
Empirical research that is not quantitative. Systematic gathering of information in field.
Participant Observation. Coding of field data. Use of archival data. Content Analysis.

Dane, Chapter 8

Homework Exercise #10: Find one article that uses either participant observation/content analysis/action research as their primary method. Read the article and discuss, briefly, whether and why you are persuaded by their findings.

WEEK 14: Review, Catch-Up, and Preparation for Final Exam