SSC272G: Intermediate Quantitative Research Methods

Number of ECTS credits: 6
Time and Place: Wed 10:00-11:30, Fri 11:30-1:00PM, VeCo3
Contact Details for Professor
Name of Professor: Olesya Tkacheva, Ph.D.
E-mail: Olesya.tkacheva@vub.ac.be
Office hours: VeCo -1.65, Wed, noon-13:00 and by appointment

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Course Prerequisites and Course Description

Course Prerequisites:
STA101

Course Description
This course exposes students to the main quantitative research methods required for analysis in the Social Sciences. Students learn the main methodological approaches from the field of Business, Communications, International Affairs and International and European Law studies. The course also provides essential skills required for analyzing and tackling major research issues.

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

A. In terms of knowledge:
   1. Demonstrate firm understanding of how different quantitative research designs be applied to answer a social science questions;
   2. Understand potential limitations of specific research design and discuss the implications of these limitations for specific findings.

B. In terms of skills
   1. Use R or Stata software to carry out independent large-n analysis;
   2. Design a quantitative inquiry to answer research question;
   3. Evaluate critically quantitative studies in their field.

In terms of attitudes, students should develop in this course:
   1. Critical attitudes, which are necessary for “life-long learning”;
   2. Greater appreciation for the diversity of methodological approaches.
**Summary:**
Number of assignments used in this course: 5
Number of Feedback occasions in this course (either written or oral): 5
Number and Types of Teaching Methods: 7

<table>
<thead>
<tr>
<th>Major Learning Objectives</th>
<th>Course Learning objectives addressing the Major Objectives (choose the most important ones that your course actually addresses)</th>
<th>Methods used to Teach Course Objectives</th>
<th>Methods (and numbers/types of assignments) used to test these learning objectives</th>
<th>Type, Timing and Numbers of Feedback given to Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Studies/Communications/International Affair Majors:</td>
<td>The bachelor knows and is able to apply common qualitative and quantitative research methods and is able to apply these in the field of business studies</td>
<td>A1: Demonstrate firm understanding of how different quantitative research designs be applied to answer a social science questions;</td>
<td>Lectures, hands-one problem solving activities in class and at home, podcasts and textbook interactive website.</td>
<td>Final, homework assignments, in-class practicum</td>
</tr>
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<td></td>
<td>A2: Understand limitations of research designs and discuss the implications of these limitations for specific findings.</td>
<td>Lectures, hands-one problem solving activities in class and at home, podcasts and textbook interactive website.</td>
<td>Final, homework assignments, in-class practicum</td>
<td>Written and oral feedback from the instructor within a week of HW submission</td>
</tr>
<tr>
<td>B1: Use R or Stata software to carry out independent large-n analysis</td>
<td>In-class practicums</td>
<td>Final, homework assignments, in-class practicum</td>
<td>Written and oral feedback from the instructor within a week of HW submission</td>
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<tr>
<td>B2: Design a quantitative inquiry to answer research question; podcasts and textbook interactive website</td>
<td>Final, homework assignments, in-class practicum</td>
<td>Written and oral feedback from the instructor within a week of HW submission</td>
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<tr>
<td>B3: Evaluate critically quantitative studies in their field. Critical evaluation of scholarly articles</td>
<td>Final, homework assignments, in-class practicum</td>
<td>Written and oral feedback from the instructor within a week of HW submission</td>
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Main Course Materials:

The course material consists of powerpoint presentations, handouts, and readings from the textbook. Powerpoint presentations will be made available after the respective classes have taken place.

The syllabus, powerpoint presentations and important messages will be uploaded to the Vesalius portal ‘Pointcarré’. Students are expected to visit this site regularly to keep abreast of course evolutions. The professor is expected to upload relevant material in a timely manner.

Course material marked as ‘suggested readings’ and ‘additional sources’ is helpful for research and to gain an increased understanding, but is not mandatory. This material can be found online or will be made available upon individual request.

Required Course Material:


For assignments and in-class activities you will be required to install one of the following statistical packages:
R (available for a free download at [https://www.r-project.org/](https://www.r-project.org/))
Stata (a student version is available for purchase at www.stata.com)

Students are encouraged to use the same package throughout the course. The instructor will provide hand-outs with tips on how to use R and/or Stata as appropriate.

Recommended References books:


For statistical packages:
Active Learning and Intensive ‘Reading around the Subject’: Additional Sources, Recommended Journals and Websites:

Learning should be an active and self-motivated experience. Students who passively listen to lectures, copy someone else’s notes, and limit their readings to required chapters are unlikely to develop their critical thinking and expand their personal knowledge system. At the exam, these students often fail to demonstrate a critical approach. Students are strongly recommended to have an updated understanding of developments related to this course and related to their wider Major. Active and engaged learning will turn out to be enriching to the overall course and class discussions. Students are invited to deepen their understanding of both theoretical and current issues from a variety of sources. Please find a list of suggestions compassing the entire course below. You are encouraged to read and browse in the leading journals of your discipline.

Leading Journals in Quantitative Methods
Econometrica
Political Methodology
American Journal of Political Science
American Political Science Review
American Economic Review

Course Assessment: Assignments Overview

The students will be evaluated on the basis of their performance in the following assignments:

- Homework assignments (5): 75% (15% each)
- Final examination: 25%
- TOTAL: 100%

Grading Scale of Vesalius College

Vesalius College grading policy follows the American system of letter grades, which correspond to a point scale from 0 – 100. All assignments (including exams) must be graded on the scale of 0-100. To comply with the Flemish Educational norms, professors should on request also provide the conversion of the grade on the Flemish scale of 0-20. The conversion table below outlines the grade equivalents.

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Scale of 100 (VeCo Grading Scale)</th>
<th>Scale of 20 (Flemish System)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>85-100</td>
<td>17.0-20.0</td>
</tr>
<tr>
<td>A-</td>
<td>81-84</td>
<td>16.1-16.9</td>
</tr>
</tbody>
</table>
Description of Activities, Grading Criteria and Deadlines

Five Homework Assignments (15% each): Students will be required to complete five homework assignments during the course. These homeworks will consist of problem sets similar to the exercises at the end of each chapter. Some of them will ask to compute statistics using formulas covered in class, others will ask to use a software package to analyse data provided by the instructor. Datasets for the HWs will be provided by the instructor, as appropriate. For data analysis sections, students will be required to submit Stata or R syntax.

HW 1: Measuring and Describing Variables (assigned on Sep 6 due on Sep 15)
This assignment will test your understanding of different types of measures discussed in assigned readings. You will be asked to evaluate existing measures of the phenomenon in question, report descriptive statistics using a software package of your choice. You should have the statistical package installed on your computer to complete this assignment.

HW 2: Confidence Intervals and Hypothesis Testing (assigned on Sep 15, due on Sep 27)
For this assignment you will be asked to solve select problems from exercises at the end-of chapters 4-6 and test a hypothesis by computing p-values and CI.

HW 3: Difference in Means and ANOVA (assigned on Oct 6 due on Oct 25)
For this assignment you will be asked to solve 2-3 problems and develop and test a hypothesis based on data provided by the instructor.

HW 4: Univariate Regression (1200-1500 words, assigned on Oct 25, due on Nov 10)
For this assignment you will be asked to solve 2-3 problems and estimate a univariate regression using dataset provided by the instructor.

HW 5: Multivariate Regression: (1200-1500 words, assigned on Nov 15, due on Nov 29)
For this assignment you will be asked to solve 2-3 problems and estimate a bivariate regression using dataset provided by the instructor.

Final Exam (in-class): The midterm will consist of short definition questions that will test
understanding of statistical concepts, 3-4 problems that will be similar to the problem sets assigned for homework assignments, and an essay question asking to evaluate a specific research design and findings. Students will be required to bring a scientific calculator and will be allowed to bring a one-page, single-space A-4 format sheet with hand-written key formulas and/or other material they believe will be useful for solving problems. Makeup examinations will be allowed only in an extreme emergency, which must be documented by a physician or college official, in advance when possible.

**Returning the originals of written work:** During the semester, you should make photocopies of your graded homeworks and return the originals to me (needed for inspection by the external examiners and the accreditation body).

**Rubrics: Transparent Grading Criteria For Each Assignment**

### Rubrics for the final

<table>
<thead>
<tr>
<th>Rubric</th>
<th>Grade Range (e.g. FAIL (0-49%))</th>
<th>Grade Range</th>
<th>Grade Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-17</td>
<td>17.5-28</td>
<td>28.5-35</td>
</tr>
<tr>
<td>1.</td>
<td>Ability to solve problems (35 points)</td>
<td>Does not know how to get started on a problem</td>
<td>A problem is partially solved, but incorrect assumptions are used or mistakes occurred during computation</td>
</tr>
<tr>
<td></td>
<td>0-9.5</td>
<td>10-16</td>
<td>16.5-20</td>
</tr>
<tr>
<td>2.</td>
<td>Knowledge of key concepts (20 points)</td>
<td>Provides wrong definition</td>
<td>Explanation is muddled, contains factual errors, uses imprecise language, provides wrong examples</td>
</tr>
<tr>
<td></td>
<td>0-7</td>
<td>7.5-12</td>
<td>12.5-15</td>
</tr>
<tr>
<td>3.</td>
<td>Interpretation of statistical output (15 points)</td>
<td>Cannot explain substantive meaning behind the computed value</td>
<td>Explanation is correct for the larger part, but some language is imprecise</td>
</tr>
<tr>
<td></td>
<td>0-15</td>
<td>15.5-24</td>
<td>24.5-35</td>
</tr>
<tr>
<td>4.</td>
<td>Understanding of the differences among research designs (30 points)</td>
<td>Misrepresents or confuses research design, makes factual errors</td>
<td>Identifies some limitations of research design in question but, makes some errors</td>
</tr>
</tbody>
</table>
Rubrics for HW Assignments

<table>
<thead>
<tr>
<th>Rubric</th>
<th>Grade Range (e.g. FAIL (0-49%))</th>
<th>Grade Range</th>
<th>Grade Range: A/A-81-100%</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>0-30</td>
<td>30.5-48</td>
<td>48.5-60</td>
</tr>
<tr>
<td>1. Ability to solve problems (60 points)</td>
<td>Does not know how to get started on a problem</td>
<td>A problem is partially solved, but incorrect assumptions are used or mistakes occurred during computation</td>
<td>Solution is based on correct assumptions, all work is clearly presented and the logic is easy to follow</td>
</tr>
<tr>
<td></td>
<td>0-10</td>
<td>10.5-16</td>
<td>16.5-20</td>
</tr>
<tr>
<td>2. Ability to use a statistical package (20 points)</td>
<td>Uses incorrect syntax, does not provide syntax</td>
<td>The syntax is appropriate for the most part, but there are occasional mistakes, or annotations are missing</td>
<td>Appropriate syntax, fully annotated and can be clearly followed</td>
</tr>
<tr>
<td></td>
<td>0-10</td>
<td>10.5-16</td>
<td>16.5-20</td>
</tr>
<tr>
<td>3. Ability to interpret statistical output (20 points)</td>
<td>Cannot explain substantive meaning behind the computed value</td>
<td>Explanation is correct for the larger part, but some language is imprecise</td>
<td>Provides accurate and precise interpretation of a value</td>
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</table>

Vesalius College Attendance Policy

As the College is committed to providing students with high-quality classes and ample opportunity for teacher-student interaction, it is imperative that students regularly attend class. As such, Vesalius College has a strict attendance policy. Participation in class meetings is mandatory, except in case of a medical emergency (e.g. sickness). Students will need to provide evidence for missing class (doctor’s note). If evidence is provided, the missed class is considered as an excused class. If no evidence is provided immediately before or after the class, the missed class is counted as an absence.

Participation implies that students are on time: as a general rule, the College advises that students should be punctual in this regard, but it is up to the professor to decide whether to count late arrivals as absences, or not.

**If students are absent for too many classes for a single course**, they receive a penalty on their overall grade for that course.

- If students are absent for five 1.5-hour class sessions of a course, they receive a penalty of 5 points on their overall grade (out of 100) for that course.
- For each additional absence (over five) for a 1.5-hour class session, an additional penalty of 1 point is applied to the reduced course grade.
Example 1: at the end of the semester, a student has a course grade of 75/100. Over the course of the semester, s/he missed 4 unexcused sessions of 1.5 hours for the course. No penalty is applied.
Example 2: at the end of the semester, a student has an overall grade of 75/100. Over the course of the semester, s/he missed 5 unexcused sessions of 1.5 hours for the course. S/he receives a penalty of 5 points (out of a hundred), and his/her final course grade is 70/100.
Example 3: at the end of the semester, a student has an overall grade of 75/100. Over the course of the semester, s/he missed 7 sessions of 1.5 hours for the course. S/He receives a penalty of 7 points, and his/her final course grade is 68/100.

**Additional Course Policies**

Hard copies of homework assignments are due at the beginning of the class. Late assignments will not be accepted unless there are serious legitimate reasons. Provision of a signed medical note is required, and notice must be given prior to the deadline.

Friday sessions will be dedicated to hand-one problem solving and using software packages. As such, students are required to bring laptops to class on each Fri.

**Academic Honesty Statement**

Academic dishonesty is NOT tolerated in this course.

Academic honesty is not only an ethical issue but also the foundation of scholarship. Cheating and plagiarism are therefore serious breaches of academic integrity.

Following the College policy, cheating and plagiarism cases will be communicated in writing to the Associate Dean and submitted to the Student Conduct Committee for disciplinary action.

If you refer to someone else’s work (including your own work) appropriate references and citations must be provided. Grammar, spelling and punctuation count, so use the tools necessary to correct before handing in assignments.

Please consult the Section “Avoiding Plagiarism” in the College Catalogue for further guidance.

**Course Schedule (Overview)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Part I: Foundations of Quantitative Inquiry</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Introduction and course overview</strong></td>
</tr>
<tr>
<td>Week 1</td>
<td>Aug 30</td>
<td>What is the Nature of Quantitative Research?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research Question and Scientific Approach to Social Science</td>
</tr>
<tr>
<td>Sep 1</td>
<td></td>
<td>Research Design and Causality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Causality vs. Correlation</td>
</tr>
<tr>
<td>Sep 8</td>
<td></td>
<td>Research Design</td>
</tr>
<tr>
<td>Week 2</td>
<td>Sep 13</td>
<td>Variables and Distributions</td>
</tr>
<tr>
<td>Week 3</td>
<td></td>
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</tbody>
</table>
### Part II: Foundations of Inference

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep 15</td>
<td>Normal Probability Distribution and Sampling</td>
</tr>
<tr>
<td></td>
<td><strong>HW 1 is due</strong></td>
</tr>
<tr>
<td>Week 4</td>
<td><strong>Hypothesis Testing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Confidence Intervals</strong></td>
</tr>
<tr>
<td>Sep 22</td>
<td><strong>P-value &amp; Type I and Type II Errors</strong></td>
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</tbody>
</table>

### Part III: Bivariate Analysis

<table>
<thead>
<tr>
<th>Week 5</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Sep 27</td>
<td></td>
<td><strong>Mean tests &amp; Quasi-Experimental and Experimental Designs</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Comparison of Means of Independent Groups</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>HW 2 is due</strong></td>
</tr>
<tr>
<td>Sep 29</td>
<td></td>
<td><strong>Comparison of Means for Paired Groups</strong></td>
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### Week 6

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Oct 4</td>
<td>No Class</td>
</tr>
<tr>
<td>Oct 6</td>
<td><strong>Comparison of Means practicum, bring a laptop</strong></td>
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<td></td>
<td>Extra office hour</td>
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### Week 7

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Oct 11</td>
<td>No Class: Midterm Study Day</td>
</tr>
<tr>
<td>Oct 13</td>
<td><strong>Introduction to bi-variate analysis</strong></td>
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<td></td>
<td>(optional attendance if you have a mid-term in another class)</td>
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### Week 8

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Oct 18</td>
<td><strong>Cross-Tabs and Survey data</strong></td>
</tr>
<tr>
<td>Oct 20</td>
<td><strong>Correlation coefficient</strong></td>
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### Part IV: Regression Analysis

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<thead>
<tr>
<th>Week 9</th>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Oct 25</td>
<td></td>
<td><strong>Bivariate Linear Regression, HW 3 is due</strong></td>
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<tr>
<td>Oct 27</td>
<td></td>
<td><strong>Bivariate Linear Regression-Practicum</strong></td>
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<tr>
<td></td>
<td></td>
<td>Bring a laptop</td>
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<tr>
<td></td>
<td><strong>Fall Recess – 30 October to 3rd November 2017 – NO CLASSES</strong></td>
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### Week 10

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Nov 8</td>
<td><strong>Multivariate Regression</strong></td>
</tr>
<tr>
<td>Nov 10</td>
<td><strong>Multivariate Regression-practicum, bring a laptop, HW 4 is due</strong></td>
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### Week 11

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Nov 15</td>
<td><strong>Extensions of Linear Regression</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Dummy Variables in a Regression Model</strong></td>
</tr>
<tr>
<td>Nov 17</td>
<td><strong>Interactive Term in Linear Regression (If time is left)</strong></td>
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</table>

### Week 12

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Nov 22</td>
<td>Interactive Term practicum, bring a laptop</td>
</tr>
<tr>
<td>Nov 24</td>
<td><strong>What can go wrong?</strong></td>
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<tr>
<td></td>
<td><strong>Sources of Bias in Regression Analysis</strong></td>
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### Week 13

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Nov 29</td>
<td>Regression Diagnostics <strong>HW 5 is due</strong></td>
</tr>
<tr>
<td>Dec 1</td>
<td>Regression Diagnostics Practicum, bring a laptop</td>
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### Week 14

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Dec 6</td>
<td>Review</td>
</tr>
<tr>
<td>Dec 8</td>
<td>Review</td>
</tr>
</tbody>
</table>

### Week 15

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>TBD</td>
<td><strong>FINAL EXAM</strong></td>
</tr>
</tbody>
</table>
Detailed Session-by-Session Course Outline

Part I: Foundations of Quantitative Inquiry

Week 1: What is the Nature of Quantitative Research?

Aug 30: Introduction to the Course and Overview of Core Requirements
Required readings: Syllabus.

Sep 1: Research Question and Scientific Approach to Social Science
Required readings:
Cumming & Calin-Jageman, Introduction to New Statistics, Ch. 1.
King, Keohane, and Verba, Designing Social Inquiry, pp. 1-12.
Pollock, Essentials of Political Analysis, pp. 48-56.
Guiding Questions:
1. What questions are suitable for social science inquiry?
2. What role does uncertainty play in social science research?
3. What are key steps in quantitative inquiry?
4. What are the potential ways to come up with a valid research question?
Further readings:

Week 2: Research Design and Causality

Sep 6: Causality vs. Correlation
Required readings:
Kellstedt, Paul & Guy D. Whitten, The Fundamentals of Political Science Research, 2nd ed. Cambridge: Cambridge University Press, 2013), Ch. 3;
King, Keohane, and Verba, Ch 3.
Guiding Questions:
1. What is the difference between causation and correlation?
2. What obstacles does a researcher face when seeking to establish a causal relation?
3. Can you think of reasons why studying causality is important in your field?
4. What different definition of causality do KKV propose?
5. How can a researcher design a study to capture the causal relation?
Further readings:

Sep 8: Research Design
King, Keohane, and Verba, pp. 12-33, Cumming & Calin-Jageman, pp. 17-24,
Kellstedt and Whitten, The Fundamentals of Political Science Research, Ch. 4.
Guiding Questions:
1. What is difference between observational and experimental research design?
2. Why random assignment should not be confused with a random sample?
3. How does random assignment help with estimating a causal effect?
4. What are the drawbacks of experimental studies?
5. What are key types of research designs based on observational studies?

Further readings:

**Week 3: Variables and Distributions**

*Sep 13: What to Measures, What to Observe and What Pitfalls to Avoid?*

*Required reading:* Cumming & Calin-Jageman, pp. 25-42 AND exercises 1-4 at the end of the chapter.

(Reading for this session is lighter than usual to allow time to finalize HW 1)

*Guiding questions:*
1. What are the four types of measures discussed by Cumming & Calin-Jageman?
2. What is reliability?
3. What is validity?
4. What are the three problematic forms of selection and how to address them?
5. Why replication is important for social sciences?

Further readings:
Bryman, Alan, *Social Science Research* (Oxford: Oxford University Press, 2014), Ch. 7

**Part II: Foundations of Inference**

*Sep 15: Normal Probability Distribution and Sampling*

*Required reading:* Cumming & Calin-Jageman, Ch. 4 (skip ESCI exercises)

*Guiding Questions:*
1. What are the properties of the normal distribution?
2. What are z-scores?
3. What is a random sample?
4. What is “dance of the means”?
5. What is a standard error?
6. What does the Central Limit Theorem say?

**HW 1 is due**
**HW 2 is assigned**

**Week 4: Hypothesis Testing**

*Sep 20: Confidence Intervals*

*Required reading:* Cumming & Calin-Jageman, Ch. 5

AND exercises 1-5 on pp. 93-94

*Guiding Questions:*
1. How do we interpret CI?
2. How do we compute CI?
3. What is z-statistic?
4. What is t-statistic?
5. What assumptions about probability distribution of t-statistic do we make when computing CI?

Further reading:

**Sep 22: P-value & Type I and Type II Errors**

Required reading: Cumming & Calin-Jageman, Ch. 6

**Guiding Questions:**

1. How to interpret p-value?
2. What is the relationship between p-value and CI?
3. How do we test a hypothesis using p-value?
4. What is the difference between Type I and Type II error?
5. Would you rather report p-value or CI in your own work and why?

Extra office hour: TBD

**Part III: Bivariate Analysis**

**Week 5: Mean tests & Quasi-Experimental and Experimental Designs**

**Sep 27: Comparison of Means of Independent Groups**

Required readings: Cumming & Calin-Jageman, Ch. 7 AND the following applications:


**Guiding questions:**

1. What does an “independent group” mean?
2. When and why is it useful to compare means across the groups?
3. What are the limitations of using a design based on independent groups even when you have a random assignment?
4. What is natural experiment? Can you think of any study that was based on a natural experiment design?

Further reading:


**HW 2 is due**

**Sep 29: Comparison of Means for Paired Groups**

Required reading: Cumming & Calin-Jageman, Ch. 8 AND


**Guiding questions:**

1. What is the paired group design?
2. What tradeoffs should be considered when selecting a paired group design?
3. What assumptions do we impose when conducting the difference in means test?

Further reading:


**Week 6: Comparison of Means (cont’d)**

**Oct 2: No Class**
Oct 6: Comparison of Means practicum
Bring a laptop to class
Required readings: Kobackoff, *R in Action*, Ch. 7 OR
Acock, *A Gentle Introduction to Stata*, Ch. 6
AND do exercises 1, 2 and 5 on pp. 189-191, and exercises 1-3 on pp.217-19.

Week 7: Bivariate Analysis
Oct 11: No class: mid-term study day
Oct 13: Introduction to bivariate analysis
No assigned readings, attendance is optional if you have a midterm in another class

HW 3 is assigned

Week 8: Bivariate Analysis Cont’d
Oct 18: Correlation Coefficient
Required readings:
Cumming & Calin-Jageman, Ch. 9, AND
Guiding questions:
1. What does coefficient of correlation measure?
2. What assumptions do we make about the probability distribution for Y and X?
3. How can we tell if the coefficient of correlation is significant or not?
Further readings:

Oct 20: Cross-Tabs and Survey Data
Required readings: Bryman, Ch. 9 and Pollock, Ch. 5
Guiding questions:
1. What are structured interviews?
2. What problems arise when collecting interview data?
3. What is the best way of testing for correlation between scale variables?
4. When for which types of measures do we use cross-tabs and for which correlation coefficient?
5. What is tau-b, how is the confidence interval computed for it?
Further reading:

Part IV: Regression Analysis
Week 9: Bivariate Regression
Oct 25: Bivariate Linear Regression
Required reading:
Cumming & Calin-Jageman, Ch. 12
AND
Guiding questions:
1. What is regression coefficient?
2. What is an OLS estimator?
3. How can one interpret the meaning of the regression coefficient?
4. What is the linear component of regression?
5. What is a stochastic component?
6. What are the assumptions of the OLS model?

Further reading:
Wooldridge, Jeffry, Introduction to Statistics, Ch 2.

HW 3 is due

Oct 27: Bivariate Linear Regression - Practicum
Required readings:
Kobackoff, R in Action, Ch. 7 OR
Acock, A Gentle Introduction to Stata, Ch. 6.
AND exercises 1 and 3 on pp. 364-366 in Cumming & Calin-Jageman.
Bring a laptop

Have a nice break!

Week 10: Multivariate Regression
Nov 8: Multivariate Regression
Required readings:
Kellstedt, Paul & Guy D. Whitten. The Fundamentals of Political Science Research, 2nd edition (Cambridge: Cambridge University Press, 2013), Ch. 9
   1. Why do we need to include additional variables into the model?
   2. How can one interpret the regression coefficients in multivariate linear regression?
   3. What does additive effect mean?
Further reading:
Wooldridge, Jeffry, Introduction to Statistics, Ch 3.

Nov 10: Multivariate Regression Practicum
Required reading: read and bring to class any recently published scholarly article that uses a multivariate regression, Be prepared to discuss it in class. Post the article on Pointcarre at least 24 hours in advance. Bring a laptop to class.

HW 4 is due

Week 11: Extensions of Linear Regression
Nov 15: Dummy Variables in a Regression Model
Guiding questions:
   1. What is dummy variable?
   2. When is it appropriate to use a dummy variable as an independent variable?
   3. How does one interpret the coefficient on the dummy variable in a liner regression model?
Further reading:
Hardy, Melissa A., Michael S. Professor Lewis-Beck, Regression with Dummy Variables (Newbery Park, CA: Sage, 1993).

Nov 17: Interactive Term in Linear Regression and ANOVA
Required readings: Cumming & Calin-Jageman, Ch. 14 AND

Guiding questions:

1. What is an interactive term?
2. When is it appropriate to include it into the regression model?
3. How does one interpret the regression coefficient on the interactive term?
4. How does one compute CI on the interactive term?

*Further reading:*

**Week 12: What can go wrong?**

Nov 22: Interactive Term in Linear Regression Practicum

*Required reading: read and bring to class any recently published scholarly article that uses an interactive term in multivariate regression. Be prepared to discuss it in class. Post the article on Poincarre at least 24 hours in advance. Bring a laptop to class.*

Bring a laptop

Nov 24: Sources of Bias in Regression Analysis

*Required readings: King, Keohane, and Verba, Ch 5 and Darrel Huff, How to Lie with Statistics, Ch. 1*

Guiding questions:

1. When OLS coefficient can be biased?
2. What is omitted variable bias?
3. What is selection bias?
4. What is measurement error?

*Further readings:*
Wooldridge, Jeffry, Introduction to Statistics, Ch. 4-6.

**Week 13: What can go wrong? (cont’d)**

Nov 29: Regression Diagnostics

*Required reading:*

Guiding questions:

1. What do we need a post-regression analysis for?
2. How can one tell if there is heteroscedasticity in the data?
3. What do residual plots tell us?

*Further readings:*
Wooldridge, Jeffry, Introduction to Statistics, Ch. 7-8.

**HW 5 is due**

Dec 1: Post-Regression Analysis Practicum

*Bring a laptop.*

**Week 14: Review for the Final**

Dec 6: Review for the Final

Dec 8: Review for the Final

**Week 15: Final TBD**