Research Methods

Fall 2019 Course Syllabus

Department of Public Policy and Administration
Course # 56:834:535

INSTRUCTOR INFORMATION

Instructor:	Michael S. Hayes, PhD
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Office:	401 Cooper Street, Room 302
Office Hours:	Mondays, 4:00pm to 5:45pm; otherwise by appointment
Office number:	856-225-6561
Class meetings:	Monday 6:00pm to 8:50pm
Location:	Business School Building, Room 335

COURSE DESCRIPTION

This course prepares graduate students to conduct their own research projects by teaching them how to develop a research question; conduct a literature review; form a testable hypothesis; identify a potential data source/methodology to test their hypothesis; and write a research proposal. Additionally, this course is designed to teach graduate students to be proficient in basic statistical concepts and techniques. The specific learning outcomes and skills taught can be found below. By the end of this course, students will be able to…

Learning Outcome(s)	Specific Skill Taught
1. Distinguish between good and bad research questions	1. Develop a research question
2. Identify ways to describe and interpret data	2. Calculate, graph, and interpret descriptive statistics
3. Understand the basics of probability theory	3. Calculate expected values
4. Learn the theory, practice, and challenges of data collection	4. Identify, download, import, and clean datasets.
5. Form and test hypotheses	5. Form a testable hypothesis 6. Create and interpret confidence intervals 7. Conduct various forms of hypothesis tests 8. Create a scatterplot 9. Run and interpret a regression
6. Develop a research project	10. Write a research proposal

PREREQUISITE KNOWLEDGE

You should have basic proficiency in high school-level algebra, as well as, a basic experience with excel spreadsheets. For additional algebra resources, please see https://www.khanacademy.org/math/algebra-home.

COURSE FORMAT

Sakai is the central location for all course content. Please check Sakai regularly to ensure that you are on task with the assigned course materials and tasks. I will email important announcements through Sakai to the email account that is linked to you on Sakai. Please check that email account regularly for updates and progress reports! It is your responsibility to check your Rutgers e-mail.

Each class will involve a combination of lecture, class discussion, and data work. For each lecture, I will post a set of study questions on Sakai that will assist you in thinking about the key takeaways from the lecture and in preparing for the exams.

Students are strongly encouraged to participate in class discussions and to ask questions. Everyone in class brings a unique perspective, and I believe these perspectives are a valuable addition to the course. Please come to class prepared and ready to participate.

REQUIRED TEXTBOOK

Wheelan, Charles. 2014. Naked Statistics: Stripping the Dread from the Data, 1st Edition, W.W. Norton & Company, Inc. ISBN: 978-0-393-34777-7. The textbook is available at the university bookstore. You can also buy a paperback version of this textbook on Amazon.

All other readings will be posted on Sakai.

COURSE REQUIREMENTS

Your final grade will be made up of the following four components: class participation, ungraded problem sets, quizzes, and a research proposal. See below for more details:

1. Class participation – 10%

Your attendance is critical for success in this course. While attendance is not mandatory, it is strongly recommended for two reasons. First, class participation accounts for 10% of your final grade. If you do not attend class, it is impossible to gain class participation points for that day. Second, we have a *large amount* of material to cover in the course, and we will be moving quickly. Missing class will put you behind and it will be very difficult to catch up.

It is expected that all students will read the assigned readings prior to class and be prepared to be called on to answer questions and engage in class discussions. The assigned readings are indicated in the course schedule.

2. Ungraded problem sets – 12% (2 points each)

Students will complete 6 ungraded assignments designed to allow students to practice the specific skill(s) taught during lectures. **All ungraded assignments are due <u>before 11:55pm on Sundays</u>**. See the course schedule for more information on due dates. Credit will be assigned on a check (100%) or check-minus (50%) scale. The problem sets are called "ungraded" because points are rewarded based on effort. If you <u>complete all problems</u> and put a "good faith" effort into the assignment, you will receive a check. If you do not answer all of the problems, or I believe you did not put a "good faith" effort into the assignment, you will receive a check-minus. You will <u>receive zero points</u> if you fail to turn in your assignment. **Late ungraded assignments will not be accepted**.

3. Quizzes – 48% (16 points each)

Students will complete three quizzes throughout the semester Students will be advised of the nature of the quiz in advance. **Make-up quizzes will not be given**.

4. Research Proposal – 30%

Students will also be responsible for preparing a research proposal. This is **due on December 9, 2019** via Sakai. More details about this assignment is found in appendix on page 7.

<u>Your final grade will be assigned as follows:</u> Letter grades will determine based on the overall course average, roundest to the nearest whole number. Only certain letter grades are available for graduate course work at Rutgers-Camden. The translation of a numeric grade to a letter grade will be done as follows:

A   92-100
B+   87-91
B   80-86
C+   76-79
C   70-74
F   0-69

GENERAL COMMUNICATION GUIDELINES

1. Check your email/Sakai at least once a week, more often if possible.
2. Be respectful, courteous, and clear in your communication. Avoid using all caps.
3. Use proper spelling and grammar in all communications.

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OTHER COURSE POLICIES

Technology

This is a course about concepts, not software. Nevertheless, we will use Microsoft Excel at times to reduce computation burden. Our classroom contains computers with this software, but I recommend you also have this on your home computer. If you do not have access to Microsoft Excel at home, it is available in the Robeson Computer Lab.

Communication with instructor

Email (michael.hayes012@gmail.com) is the fastest way to reach me. I will usually respond to emails within 48 hours of receipt. If I do not respond within 48 hours, please try emailing me again. In addition to office hours, private appointments are also available upon request. These can be conducted via phone, Skype, or in person.

I use Sakai and email to communicate with you. Check your Rutgers email for announcements, assignments, and solutions. It is your responsibility to check your Rutgers email. I acknowledge every email that I receive.

Make-up Assignments & Quizzes

I **do not** accept late ungraded assignments. **Please also submit your completed quizzes on their respective due dates**. If you are unable to do so, you may petition to take a make-up quiz, but this is granted only in exceptional circumstances. I reserve the right to require documentation before giving a make-up quiz. Please let me know as soon as you see a problem developing so that we can consider the best means of addressing it. *I am unlikely to allow a make-up test if you do not get in touch with me prior to the date of the quiz.*

Students with Disabilities

If you have or believe you have a disability that may impede your learning, please contact the Disability Services Office. I will make every effort to accommodate you in accordance with Rutgers University's policy, procedures and College Coordinator recommendations. Additional information can be found at http://studentaffairs.camden.rutgers.edu/disability.html.

Attendance

Attendance is entirely optional. However, you are responsible for everything covered in this class whether it was covered in the readings or not. For most students, attendance is necessary condition for learning the material. The PowerPoint slides are not a substitute for attending the class, because the slides are not self-contained – they are props to give structure to my lectures and our class discussions. If you need to miss a class, be sure to get notes and a recap from a classmate.

Academic Honesty

Violations of academic integrity include cheating on quizzes or handing in assignments that do not reflect your own work and/or the work of a study group in which you *actively* participated. *I have a policy of zero tolerance for cheating*. Violations will be referred to the appropriate university authorities.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

More information on the Rutgers University Academic Integrity Policy can be found at http://academicintegrity.rutgers.edu/.

ON-CAMPUS STATISTICS TUTOR

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Location: Graduate School Office on the 3rd Floor of Armitage Hall

COURSE SCHEDULE

Week	Date	Topic(s)	Assignment/Readings
1	Sept. 9	Basic Statistical Concepts *Developing a Research Question*	*W*, Introduction & Chapter 1 *A&L*, Chapter 1; Chapter 3 (pp. 63-72)
2	Sept. 16	Descriptive Statistics I	**Problem Set #1 Due** *W*, Chapters 2 and 3 *A&F*, Chapter 3 (pp.31-50)
3	Sept. 23	Descriptive Statistics II	**Problem Set #2 Due** *W*, Chapter 4 *A&F*, Chapter 3 (pp.51-61)
4	Sept. 30	**Take-Home Quiz #1** *Conducting a Literature Review*	*A&L*, Chapter 2
5	Oct. 7	Basics of Probability	**Research Topic Due** *W*, Chapters 5, 5 ½, and 6 *A&F*, Chapter 4 (pp.73-85)
6	Oct. 14	Sampling Theory *Collecting Data*	**Problem Set #3 Due** *W*, Chapters 7 and 8 *A&F*, Chapter 4 (pp.85-99)
7	Oct. 21	No Class	
8	Oct. 28	*Forming a Testable Hypothesis* Hypothesis Testing I	*W*, Chapter 9
9	Nov. 4	Hypothesis Testing II	**Problem Set #4 Due** *W*, Chapter 10
10	Nov. 11	**Take-Home Quiz #2** Regression Analysis I	*W*, Chapter 11
11	Nov. 18	Regression Analysis II	**Problem Set #5 Due** *W*, Chapter 12
12	Nov. 25	*Selecting a Methodology* Program Evaluation	**Problem Set #6 Due** *W*, Chapter 13
13	Dec. 2	**Take-Home Quiz #3** TBD	
14	Dec. 9	No Class	**Research Proposal Due**

Please note: This schedule may be adjusted. *W* = Wheelen book. *A&L* = Adams & Lawrence readings from Sakai. *A&F* = Agresti and Finlay readings from Sakai.

Appendix A: Important Dates

Assignment/Quiz	Due Date
Problem Set #1	Sunday, September 15th before 11:55pm
Problem Set #2	Sunday, September 22nd before 11:55pm
Quiz #1	Sunday, September 29th before 11:55pm
Research Topic	Sunday, October 6th before 11:55pm
Problem Set #3	Sunday, October 13th before 11:55pm
Problem Set #4	Sunday, November 3rd before 11:55pm
Quiz #2	Sunday, November 10th before 11:55pm
Problem Set #5	Sunday, November 17th before 11:55pm
Problem Set #6	Sunday, November 24th before 11:55pm
Quiz #6	Sunday, December 1st before 11:55pm
Research Proposal	Monday, December 9th before 11:55pm

Appendix B: Research Proposal Assignment and Guidelines

Purpose
The research proposal assignment allows students to create research plan which they will eventually implement in their research capstone course.

Due Dates
There are two components to the research proposal assignment. First, you will submit a one-page double-spaced word document that includes a quick summary of a public policy or public management research topic by **Sunday, October 6, 2019**. It should include a research question, a short description of why this is an important research question, and a list of five sources for the review of literature. *Any student who does not turn in a complete proposal on the due date will be penalized one letter grade on the research proposal assignment*.

The research proposal itself should be submitted via Sakai on **December 9, 2019**. Late assignments are deducted a full letter grade each additional day after the due date.

Formatting
The policy memo should be typed, double-spaced, using Times New Roman font. Borders should be approximately 1'' and typeface should be 12 point. Student are encouraged to use headings and sub-headings where appropriate in order to improve the readability of their memo.

Figures and Tables
Students should label all figures and tables. Figures include any charts, graphs, or other visual representations of data. Figures and tables should be numbered sequentially according to where they are referenced in the text of the memo. Numbering for figures should be independent of numbering for tables (i.e. there will be both a Figure 1 and Table 1). All figures and tables should appear in the appendix of the memo. *Figures and Tables should only be used when appropriate*.

References
Students should reference materials in their paper with footnotes, endnotes, or parenthetical citation. I do not require a particular style, but please be consistent in the style that you select. You are required to adhere to the academic honesty, so make sure that you do not accidentally fail to cite a source.

Organization
The policy memo should include the following components, labeled as individual sections. The total length **cannot exceed** **15 double-spaced pages**, not including reference page, figures/tables. If you are above fifteen pages, **you will lose 10%** of the assignment points.

1. Introduction (no more than two pages)

    In this section, you will concisely do the following:
    1. Attract the readers' interest by telling that this research proposal will relate to something interesting. What makes the topic interesting?
    2. State the research question(s) that will be answered.

3. Quickly summarize the key takeaways from your literature review, and describe how your research will contribute to previous studies.
4. Quick outline of the remaining sections of the research proposal.

2. Review of the Literature (no more than five pages)

This section first reviews the current research findings related to your research question. This should expand upon your introduction by explaining to the reader what is important to know from the current literature on this topic. Summarize, synthesize, review, and critique the current state of the literature. Building on your review of the current literature, you will explain how your study will help fill the gap in the current literature. Specifically, how is your study going to bring new knowledge to this literature? Finally, you will conclude this section with a clear hypothesis that you plan to test. This hypothesis should be grounded and consistent with your review of the literature.

This section should include **at least 10 sources drawn from academic or rigorous practitioner journals**. Be sure to use proper citation format. If you need assistance with research and citation style guides, please refer to the Rutgers Library's resources such as the reference librarians.

3. Data Sources and Variables (no more than three pages)

In this section, you will concisely explain to the reader where your data comes from, why this data is the best source to answer your research question, and how you will utilize the data to create your dependent, independent, and control variables. Depending on your particular data source or research proposal, you might also need to argue when a particular variable is a good measurement of the concept that you will be analyzing. For example, if your research project is focusing on understanding the factors that affect economic growth across U.S. states, you need to make an argument why you are measuring economic growth via a variable like unemployment rates instead of some other variable.

4. Methodology (no more than three pages)

In this section, you will concisely explain your selected methodology for testing your hypothesis/answering your research question. What particular analytical tool (e.g. survey, interview, hypothesis testing, conference interval, regression, graph, etc.) are you using to answer your question? What are the strengthens and limitations of this tool?

5. Timeline and Next Steps (less than two pages)

This is arguably the most important section your proposal because it forces you to think critically about the process of implementing your research project in the coming months. This section must include: a detailed timeline for the project, a discussion of how you will be collecting your data, a discussion of likely challenges you will face, a discussion of further skills you might need to learn to implement your project (e.g. a statistical software program, an advanced methodology, etc.).

Evaluation of Research Proposal

I will use the following rubric to evaluate the research proposal:

	Unacceptable	Minimally Developed	Moderately Developed	Strongly Developed
Introduction	The research issue is not clearly identified. The statement of the problem, its significance, purpose, and hypotheses were omitted or inappropriate. No connections were made to the literature. Research questions, definitions, assumptions and limitations were omitted or inappropriate given the context, purpose, or methods of the study. **[10 points]**	Although a research issue is identified, the problem statement is too broad or the description fails to establish the importance of the problem area. The hypothesis is not well stated. Connections to the literature are unclear, debatable, or insignificant. Research questions, definitions, assumptions and limitations were poorly formed, ambiguous, or not logically connected to the description of the problem, purpose or methods of study. **[14 points]**	Identifies a relevant research issue and articulates a specific problem of importance. The hypothesis is clearly stated. Connections to the literature are established. Research questions are stated, connected to the description of the problem, and supported by the literature. Constructs have been identified and variables have been operationally defined. Definitions, assumptions and limitations are presented. **[17 points]**	Articulates a specific, significant research issue by connecting that problem to the literature. The statements of purpose flow logically from the introduction. The hypothesis is clearly stated. Articulates a clear, and succinct research questions and definitions given the purpose, design, and methods of the proposed study. Constructs have been identified and variables have been operationally defined. Thorough discussion of definitions, assumptions and limitations has been presented. **[20 points]**
Literature Review	Insufficient information has been gathered to fully explain the nature of the problem or the need for further study. Several sources used are not appropriate nor are they specific enough to the topic. The review is unorganized and lacks any coherent structure or sequence. None or very few citations have been correctly executed in the appropriate format. **[15 points]**	Information is gathered from research sources but not all sources may have been appropriate or specific to the topic. The problem has not been fully explained and/or the rationale for further study has not been made sufficiently clear. Significant aspects of the problem may have been omitted from the discussion. The review is unorganized and lacks any coherent structure or sequence. There are multiple factual errors and only some information is cited properly and in the appropriate format. **[20 points]**	Information is gathered from multiple, appropriate research sources and explains what is known about the problem and some areas need further study. Most but not all areas of the problem are adequately addressed in the discussion. The review is organized and presented in a logical sequence and/or structure. Nearly all information is correct, cited properly and in the appropriate format. **[25 points]**	Information is gathered from multiple, varied, research appropriate sources, fully explains what is known about the problem and makes a compelling argument for areas in need of further study. The review is well organized and presented in a highly logical sequence and/or structure. All information is factually correct. All information is cited properly and in the appropriate format. **[30 points]**

	Unacceptable	Minimally Developed	Moderately Developed	Strongly Developed
Data	Procedures for treatments and gathering data were omitted. **[10 points]**	Procedures (permissions, treatments, and data gathering) were confusing, incomplete, or lacked relevance to purpose, research questions, or sampling strategy. **[14 points]**	Procedures for implementing the study (permissions, treatments, and data gathering) were identified and described in a chronological fashion. **[17 points]**	Procedures were chronological and replicable, with clear distinctions between researcher and participant actions. Clear and reasonable strategies were presented for seeking permissions and for the ethical treatment of human subjects. **[20 points]**
Method	The method is inappropriate or has not been identified and/or described using standard terminology. No discussion or critique of research methods was presented. Limitations and assumptions are omitted. No evidence of reliability and validity are presented. **[10 points]**	The method is confusing or incomplete given the research questions and stated methodology. Discussion of research methods was inadequate to warrant claims. Inadequate attention has been given to eliminating alternate explanations and controlling extraneous variables. Several limitations and assumptions have not been identified. Evidence of reliability and validity are insufficient. **[14 points]**	The method has been identified and described in sufficient detail. Attention has been given to eliminating most alternate explanations and controlling extraneous variables. Discussion of research methods was adequate to warrant claims. Most limitations and assumptions have been identified. Reasonable evidence of validity and reliability was presented. **[17 points]**	The method has been identified and described in sufficient detail. Attention has been given to eliminating nearly all alternate explanations and controlling extraneous variables. Thorough critique of the appropriateness of research methods to warrant claims has been presented. Appropriate and important limitations and assumptions have been identified. Strong evidence of validity and reliability was presented. **[20 points]**
Next Steps	The timeline is unrealistic, inappropriate or lacks sufficient detail. A plan for data collection is confusing or not well thought-out. No discussion on expected challenges, or on what further skills student needs to learn to implement your project. **[5 points]**	The timeline includes adequate details, but it is not realistic. A plan for data collection is incomplete. Includes only a limited discussion on expected challenges, or on what further skills student needs to learn to implement your project. **[6 points]**	The timeline is adequate and realistic. A plan for data collection is sound and reasonable. A solid discussion on expected challenges ahead, and the student has some ideas of what additional skills they need to develop. **[8 points]**	The timeline is adequate and realistic. The student describes a clear plan for data collection that could be implemented right away. The student has identified potential challenges ahead and has suggested possible solutions to these challenges. The student has a clear idea of what additional skills they need to develop. **[10 points]**