CRIM 782 Statistics I

Class Information

* Instructor: Prof David Wilson
* Day and Time: Wednesday 1:30pm—4:10pm
* Location: ENGR 1109
* Lasted Edited: July 27, 2021

Office

I will not have set office hours, but I am happy to schedule a time to meet with any student via Zoom or in-person on a day that I am on campus. To set up a time, email me at dwilsonb@gmu.edu. If it is urgent, you can call or text me at 301.408.8331.

Course Description

This course will focus on descriptive and inferential statistical methods and theory. The logic of inferential statistical methods in general and null hypothesis significance testing, in particular, will be explored. Additionally, we will study widely used statistical procedures within the social sciences. Finally, this course will provide familiarity with performing data analyses using the computer statistical software program R.

Course Prerequisite

A prerequisite for this course is an undergraduate or graduate social science research methods course (e.g., from sociology, psychology, criminal justice, economics, or political science department) or an undergraduate statistics course, preferably from a social science department. Although we use computer software to perform most of the computations, you cannot study statistics without doing some math. Statistics is math. I am assuming that you understand the basic principles of mathematics, such as the order of operations, exponents and roots, and fractions. I am also assuming that you can understand basic algebraic equations.

Course Objectives and Learning Methods

This course aims to prepare you for graduate-level research, including your master’s and doctoral thesis. Upon completion of this course, you should have a solid conceptual understanding of descriptive statistical methods, including the graphical display of quantitative data, and be able to apply commonly used inferential statistical methods to real-world research problems. You will also have a firm understanding of null hypothesis significance testing, including its limitations, the central limit theorem, the use of confidence intervals, and the distinction between parametric and nonparametric inferential methods. You will also develop skills in using R to perform statistical analyses.

Teaching Methods

This class will be a “flipped” class; lectures will be entirely online in Blackboard. We will use class time to answer any questions you have from the lectures, review homework, do class exercises, and get started (or finish!) homework due the following week. Given this approach, you must come to class prepared. You will have difficulty making effective use of class time if you do not.

Course Requirements and Grading

Your grade in this class will be based on weekly homework and two exams (a mid-term and a final). If you complete the homework, and not just some of it, it will be graded as a pass. If you do not complete a homework assignment by the due date, it will be graded as a fail. There 10 weekly homework assignments. Your overall homework grade will be computed as follows:

|  |  |  |
| --- | --- | --- |
|  | 10 homeowrk assignments | A |
|  | 9 homework assignments | A- |
|  | 8 homework assignments | B+ |
|  | 7 homework assignments | B |
|  | 6 homework assignments | B- |
|  | Less than 6 | F |

The mid-term will be an in-class exam and will involve a range of question types and involve the use of R. The final exam will be a take-home exam and will require you to analyzing and interpreting real-world data. The final exam will be cumulative, requiring knowledge gained throughout the entire semester. Final grades will be a weighted average based on the following weights.

|  |  |  |
| --- | --- | --- |
|  | **Assignment** | **% of Final Grade** |
|  | Homework | 20 |
|  | Mid-term | 30 |
|  | Final Exam | 50 |

Letter grades will be converted to a 4-point scale (like a GPA). Thus, an A will be 4.0, A- 3.67, B+ 3.33, B 3.0, B- 2.67, C+, 2.33, C 2.0, F 0.0. Final grades will be compute as the weighted average of these values and assigned as follows:

|  |  |  |
| --- | --- | --- |
|  | **Final Grade** | **Cut-off** |
|  | A | 3.9 |
|  | A- | 3.57 |
|  | B+ | 3.23 |
|  | B | 2.9 |
|  | B- | 2.57 |
|  | C | 2.0 |

It is your responsibility to come to class prepared. Preparation involves having completed the readings and viewing the online videos assigned for that week.

Texts and Readings

**Required book for this course:**

Weisburd, D., Britt, C., Wilson, D. B., & Woodicth, A. (2021). Basic Statistics in Criminology and Criminal Justice (5th Edition). New York: Springer. ISBN-13: 978-3030479664

Note: If cost is an issue, I have posted a PDF of the page proofs from the last round of edits (there are only minor differences between this PDF and the final published book).

**Optional book for this course:**

Wooditch, A., Johnson, N. J., Solymosi, R., Ariza, J. M., & Langton, S. (2021). A Beginner’s Guide to Statistics for Criminology and Criminal Justice Using R (1st ed.). New York: Springer. ISBN-13: 978-3030506247

Tentative Course Schedule

The following course schedule is subject to change. The date at the top of the syllabus indicates the last date on which I made any changes.

|  |  |  |
| --- | --- | --- |
| **Date** | **Topic** | **Readings** |
| Week 1: Aug 26 | Class Overview and Getting Setup and Started | Weisburd & Britt, Chapters 1 & 2 |
| Week 2: Sept 2 | Frequency Distributions & Measures of Central Tendency | Weisburd & Britt, Chapters 3 & 4 |
| Week 3: Sept 9 | Variability & z-Scores | Weisburd & Britt, Chapter 5 |
| Week 4: Sept 16 | Probability | Weisburd & Britt, Chapter 7 |
| Week 5: Sept 23 | The Sampling Distribution | Weisburd & Britt, Chapter 8 |
| Week 6: Sept 30 | Hypothesis testing | Weisburd & Britt, Chapter 6 |
| Week 7: Oct 7 | Mid-term |  |
| Week 8: Oct 14 | The Student’s t-test | Weisburd & Britt, Chapter 10 and 11 |
| Week 9: Oct 21 | Oneway ANOVA | Weisburd & Britt, Chapter 12 |
| Week 10: Oct 28 | Two-way ANOVA | TBD |
| Week 11: Nov 4 | Correlation | Weisburd & Britt, Chapter 14 |
| Week 12: Nov 11 | Simple regression | Weisburd & Britt, Chapter 15 |
| Week 13: Nov 18 | No class – ASC Conference |  |
| Week 14: Nov 25 | No class – Thanksgiving |  |
| Week 15: Dec 2 | Chi-square & the Binomial test and Review for final | Weisburd & Britt, Chapter 9 |
| Week 16: Dec 9 | Final exam due by 5:00pm (via Blackboard) |  |

Gender Identity and Pronoun Use

If you wish, please share your name and gender pronouns with me and how best to address you in class and via email. For example, I use he/him/his for myself, and you may address me as Dr. or Prof. Wilson in email and verbally.

Statement on Academic Integrity

I expect adherence to the University Honor Code (http://oai.gmu.edu/honor-code/). If I witness a suspected violation of the Honor Code, I will follow the standard reporting procedures as outlined in the University Handbook.

The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and relatively simple principles to follow at all times are:

1. All work submitted be your own.
2. When using the work or ideas of others, including fellow students, give full credit through accurate citations.
3. If you are uncertain about the ground rules on a particular assignment, ask for clarification.

No grade is so important as to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles. In this class, we will adhere to the APA citation and referencing style, as it is the dominant approach in criminology. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please ask.

Students with Disabilities

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you seek accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474.