



Florida State University
College of Criminology and Criminal Justice
CCJ 5706 Applied Statistics in Criminology I

Credit Hours: 3
Meeting Time: Mondays, 11:00am-1:30pm
Meeting Location: CRM 0214

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Office hours: Wednesdays 9:00am-11am (and by appointment)

What you Will Learn

The purpose of this course is to introduce students to the fundamental statistical concepts, theories, techniques, and computations commonly used in behavioral science research. Topics include descriptive and univariate statistics, probability theory, as well as univariate and bivariate hypothesis tests. As this course is a foundational statistical course, a significant amount of time will be devoted to discussing the theory and concepts that underlie more advanced statistical procedures. With this in mind, many computations and analyses will be performed by hand (with a calculator). However, in practice, quantitative researchers almost never perform analyses this way. For this reason, we will also spend time discussing the importance of statistical software and students will learn basic skills pertaining to importing, cleaning, managing, and analyzing data. Most of these skills will be directly transferable to any statistical software package (e.g., SPSS, SAS, R, etc.), but we will use Stata.

Course Objectives

The main objectives of this course are:

1. To be able to understand the importance of data and statistics
2. To be able to compare different types of data
3. To be able to summarize key theories underlying statistical analysis
4. To be able to choose appropriate analyses given different types of data
5. To be able to determine which visualization techniques are best aligned with different types of data
6. To be able to explain the concept of statistical significance
7. To be able to calculate statistics common in the behavioral sciences
8. To be able to interpret statistics common in the behavioral sciences
9. To be able to develop a plan of analysis
10. To be able to use Stata and other statistical software effectively

Required Course Materials

1. Agresti, A., Franklin, C., Klingenberg, B. (2021). *Statistics: The Art and Science of Learning from Data* (5th Edition). Pearson: Boston, MA. ISBN: 9780136468769.
 - a) You are NOT required to buy a book that comes with an online access code, but the materials included may be useful.
 - b) If the book is too expensive, you can probably get away with the 4th Edition:
Agresti, A., & Franklin, C. (2017). *Statistics: The Art and Science of Learning from Data* (4th Edition). Pearson: Boston, MA. (Hardcover ISBN: 978-0321997838; Paperback ISBN: 978-1292164779).
2. Articles and other materials that will be made available in the course library on Canvas (reading list provided at the end of the syllabus).
3. While there is no Stata textbook required for this course, I understand that some students may want some reference materials or books to help inform future projects or to learn more about Stata. For this reason, I have provided the following list of books which are **RECOMMENDED** but are not required for this course:
 - a) Acock, A. C. (2023). *A gentle introduction to Stata (6th Ed.)*. College Station, TX: Stata Press. ISBN: 978-1-59718-367-3 (\$68.00).
 - b) Long, J. S. (2009). *The workflow of data analysis using Stata*. College Station, TX: Stata Press. ISBN: 978-1-59718-047-4 (\$54.00).
 - c) Mitchell, M. N. (2020). *Data management using Stata: A practical handbook (2nd Ed.)*. College Station, TX: Stata Press. ISBN: 978-1-59718-318-5 (\$64.00).

Software

This class requires the statistical software program Stata (preferably release 15, 16, or 17, versions IC, SE, or MP), as this will be the primary vehicle for the procedures you learn in this class. However, we will address and discuss the theory and logic underlying these procedures in an effort to prepare you to perform them in other software packages if you choose. Stata is available in the graduate student computer lab as well as via the FSU Virtual Lab.

So, why Stata? Well, Stata is in no way perfect, but I have found it to be well-rounded, relatively easy to use, and readily available. In addition, resources are widely available and easily accessible. The point of this class is not to force you to use Stata, but rather to use Stata as a vehicle to implement the skills and tools we will discuss in the course. Since software packages fall in and out of favor so quickly, the larger goal of this course is to assist you in your familiarity of the underlying logic of basic statistics, programming, and syntax in an effort to develop and hone your data management and analytic skills regardless of the software package you decide to use. With that said, Stata is pretty awesome.

Evaluation and Grading

Course grades will be based on the following:

Quizzes:	600 points (60%)
Problem Sets:	400 points (40%)
Total points possible:	1000 points

Grading Scale

A	94-100	C	74-76
A-	90-93	C-	70-73
B+	87-89	D+	67-69
B	84-86	D	64-66
B-	80-83	D-	60-63
C+	77-79	F	Below 60

Course Structure and Format

This is a traditional, in-person course with topics organized around the weeks of the semester. Your overall grade in the class will be based on your performance on two separate components:

1. **Quizzes**: (60% of your overall grade and 600 out of 1000 course points). A total of four quizzes, worth 150 course points each, will be administered throughout the semester (see course schedule for dates). Quizzes will consist of approximately 5 short answer/essay questions and mathematical computations (appropriate formulae will be provided when necessary). Quizzes will be timed (60 minutes) and completed on Canvas. The quiz will be made available after class the week they are assigned and students will have until the next class meeting (one week) to complete the quiz. Students can simply type their answers to short answer questions directly into Canvas. For questions that require computation, students can type their answers into a separate Word document or complete the computation on a piece of notebook or graph paper (by hand) and then upload a scan or picture to Canvas. If you decide to complete your computations by hand, it is your responsibility to ensure that all of your work is legible before submitting your quiz.
2. **Problem Sets**: (40% of your overall grade and 400 out of 1000 course points). A total of four problem sets, worth 100 points each, will be completed throughout the semester (see course schedule for dates). Problem sets will be made available after class on the week they are due and must be submitted before the next class meeting. Problem sets will include questions related to and involving statistical analyses, computations, interpretation of results, and/or the dissemination of findings. Problem set questions serve as practice questions for the quizzes. For questions that require analyses in Stata, students are required to provide copies of their do-files and output (i.e., log files). For questions requiring computations, students are required to document all steps of their work. All answers involving computations must be typed or legibly hand written on

notebook or graph paper. Additional information, including specific requirements and directions, for each assignment will be provided in class and will be available for download on Canvas. All assignments should be submitted via Canvas **before the beginning of class**. If you decide to handwrite your computations, it is your responsibility to ensure that all of your work is legible after scanning and before submitting your assignment on Canvas. No late assignments, or assignments submitted via email, will be accepted.

Policies and Requirements

For the vast majority of us, statistics are difficult. No way around it. This doesn't mean that we can't think statistically, it just means that it typically doesn't come naturally, and we have to work a little harder to accomplish this feat. With that said, if you want to be successful in this course (and with quantitative analysis more broadly), you will have to put in the necessary work. This would include, at an absolute minimum, that all students: (1) attend every class meeting; (2) have completed the assigned readings BEFORE coming to class; (3) work through the textbook examples and practice questions; and (4) actively participate in class activities and discussions. While this is not a precise recipe for success, students who follow these broad guidelines are far more likely to succeed in the course.

Thinking statistically can be quite challenging and, at times, extremely frustrating. But, the best way to learn some of the concepts and skills we will be covering in class will be to trudge on and be persistent. Most of the time, your first attempt will fail miserably. Learning how to recognize your (and others') mistakes is one of the primary skills I hope you learn in this course and there is no substitute for hands-on experience in this regard. As Jedi Master Yoda noted in *The Last Jedi*, "The greatest teacher, failure is." With this in mind, I encourage you to be persistent when you hit a wall—don't give up. Sometimes it helps to take a break and work on something else for a while and then come back to the problem with a fresh set of eyes. Based on the importance of this set of skills—and I'm going to be firm on this—I am happy to help you with course content only AFTER you have tried to resolve any issues on your own AT LEAST THREE TIMES. If and when you reach that point, feel free to come to me with your questions, syntax, datasets, and anything else.

Course Expectations

You are highly encouraged to attend each and every class. Information will be covered in class that is not available elsewhere. If you miss a class I highly recommend that you borrow notes from one of your fellow classmates and talk to me about any additional clarification you may need. I do not post my PowerPoint slides on Canvas and will not provide students who have missed a class with my notes.

In addition, the following expectations will be enforced:

1. All readings are expected to be completed by the assigned date.
2. You are expected to complete all assignments on time.
3. Plagiarism and cheating will not be tolerated. Note the Academic Honor Policy below.

4. Extend courtesy and respect to your fellow classmates at all times. Disrespect or hateful speech of any kind directed toward other students, myself, or anyone else will not be tolerated.
5. If you have any problem or experience any unforeseen circumstances, do not hesitate to contact me. The sooner you inform me of an issue, the more options we have to get it resolved.
6. Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.
7. All work must be original and created for this semester's course.

Requesting Points, Re-Grading Assignments, Extra Credit, Late/Make Up Work and Rounding
I know it is tempting to **request more points** or a change to your grade as we move through the semester. Besides, "it never hurts to ask," right? I've deliberately designed this course to provide you with as many opportunities as possible to achieve the grade you have in mind. There are many, many opportunities for points outside of exams, which gives you far more control over your final grade in the class. With that in mind, I cannot accommodate grade change requests, appeals for more points, or any similar requests. For these reasons, any requests will be ignored, and I will not respond to emails making these requests.

Assignments will be graded as quickly as possible once turned in. It is possible that the course TA or I made a mistake when grading your assignment and I want to ensure that any mistakes are corrected in due course. However, instances of **re-grading** assignments should be reserved for rare situations in which a mistake was made during the grading process. With this in mind, re-grading requests must be made within 5 days of the grades being posted to Canvas. In addition, for any re-grading request, the course TA and/or I will grade your assignment as if it were a fresh submission, meaning you are just as likely to lose points as you are to gain them.

In regard to **extra credit**, I do not offer extra credit in this course. Please do not ask.

Late work will only be considered or accepted in exceptional circumstances. Specifically, students must 1) notify me within 24 hours of missing the assignment, AND 2) provide me with a university approved excuse for missing the assignment (see the "University Attendance Policy" below for what constitutes a university approved excuse). I may request written documentation for the excuse if necessary. If this procedure is not followed, you will receive a score of zero for the assignment.

Grades are **rounded** to the nearest whole number when calculating your final grade. For example, an 89.5 (or greater) will round to a 90, but an 89.4 will round to an 89. This is the only rounding that will take place for this course. I do not round quiz or problem set grades. Any requests for additional rounding or another form of rounding will not receive a response.

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who

have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>).

While you are encouraged to support one another and work collaboratively when appropriate, plagiarism or other academic dishonesty of any kind will not be tolerated in this class. Incidents of cheating or plagiarism of any type will be rigorously pursued. Any form of academic dishonesty will result in a grade of "zero" for that particular assignment. I reserve the right to screen for plagiarism, including electronic citation checkers (e.g., SafeAssign). For this course, you may be required to submit assignments to SafeAssign. All written materials will become source documents in the SafeAssign database and will be used solely for the purpose of detecting plagiarism.

Academic Success

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Dean of Students office to learn more.

Americans with Disabilities Act

Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with academic standards of the course while empowering the student to meet integral requirements of the course.

To receive academic accommodations, a student:

1. Must register with and provide documentation to the Office of Accessibility Services (OAS)
2. Must provide a letter from OAS to the instructor indicating the need for accommodation and what type
3. Should communicate with the instructor, as needed, to discuss recommended accommodations. A request for a meeting may be initiated by the student or the instructor.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided. This syllabus and other class materials are available in alternative format upon request.

For more information about services available to FSU students with disabilities, contact the

Office of Accessibility Services
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
oas@fsu.edu
<https://dsst.fsu.edu/oas>

Confidential Campus Resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program
University Center A, Rm. 4100
(850) 644-7161
Available 24/7/365
Office Hours: M-F 8-5
<https://dsst.fsu.edu/vap>

Counseling and Psychological Services
Askew Student Life Center, 2nd floor
942 Learning Way
(850) 644-8255
<https://counseling.fsu.edu/>

University Health Services
Health and Wellness Center
(850) 644-6230
<https://uhs.fsu.edu/>

TENTATIVE SCHEDULE AND ASSIGNED READINGS

Week	Date	Topic
1	1/9	Part I: Why data and statistics are important
2	1/16	***No Class—MLK Day***
3	1/23	Part II: Univariate Statistics *** Problem Set #1 Assigned ***
4	1/30	Part II: Univariate Statistics *** Quiz 1 Assigned ***
5	2/6	Part III: Probability Theory
6	2/13	Part III: Probability Theory
7	2/20	Part III: Probability Theory *** Problem Set #2 Assigned ***
8	2/27	Part III: Probability Theory *** Quiz 2 Assigned ***
9	3/6	Part IV: Statistical Inference
10	3/13	***No Class—Spring Break***
11	3/20	Part IV: Statistical Inference
12	3/27	Part IV: Statistical Inference *** Problem Set #3 Assigned ***
13	4/3	Part IV: Statistical Inference *** Quiz 3 Assigned ***
14	4/10	Part V: Bivariate Statistics
15	4/17	Part V: Bivariate Statistics *** Problem Set #4 Assigned ***
16	4/24	Part V: Bivariate Statistics *** Quiz #4 Assigned ***
Finals	5/1	***Quiz #4 due before 11:00am EST on Monday, 5/1***

This syllabus is only tentative and highly subject to change. I reserve the right to modify this syllabus at any time throughout the semester and it is your responsibility to stay up-to-date on any changes that are made.

Part I: Why data and statistics are important (1/9)

Agresti et al., 2021, Chapter 1

For next time: Start poking around Stata. There's no need to do anything too detailed, just acquaint yourself with the user interface and how things are organized.

Stata Manual (2017). Chapters 1 & 2 (pp. 1-32). College Station, TX: StataCorp.

These chapters should give you a general overview of the Stata interface and also presents some commonly used commands. In addition, these introduction chapters also provide a basic overview of the structure of the syntax in Stata.

Watch the following videos from the Stata YouTube channel:

1. Interface overview:

https://www.youtube.com/watch?v=nV5WfR92LIM&index=27&list=PLN5IskQdgXWk7ft_JxyirnTfsd5BY4iba

2. Labeling variables:

<https://www.youtube.com/watch?v=l5QM2RzU3VM&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j>

3. Value labels:

<https://www.youtube.com/watch?v=CiSIeQVWxW0&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j&index=2>

4. Missing data values:

<https://www.youtube.com/watch?v=6HV2773-dVM&index=8&list=PLN5IskQdgXWmih67kPngkd0P022h1j82j>

5. Using the 'generate' command:

https://www.youtube.com/watch?v=E_wCh0rf4p8

6. Basic descriptive statistics:

<https://www.youtube.com/watch?v=3WpMRtTNZsw>

The Stata YouTube channel is very helpful in providing basic overviews of Stata features and procedures. Just a word of warning, the demonstrations make use of the Stata dropdown menus and the graphical user interface (GUI) included in Stata. We will not be relying on the GUI in this course! However, Stata will issue the necessary syntax to complete the processes carried out via point and click procedures. Pay attention to the syntax (including commands) that are issued after the point and click procedures are completed. Also, feel free to take a look at other Stata YouTube videos if you choose.

Using the auto.dta data (*sysuse auto.dta, clear*), or another sample dataset of your choice, try out some of the commands discussed in these materials. Make sure you are using syntax in a do-file and not the graphical user interface (GUI).

Coming up: Class is cancelled on 1/16 in observation of MLK Day

Part II: Univariate Statistics (1/23-1/30)

Agresti et al., 2021, Chapter 2

Blalock, H. M. (1979). *Social Statistics* (2nd Ed.). McGraw-Hill. Chapter 2 (available on Canvas).

Important Dates

- Problem Set #1 will be available on 1/23 (due before the start of class on 1/30)
- Quiz #1 will be available on 1/30 (due before the start of class on 2/6)

Part III: Probability Theory (2/6-2/27)

Agresti et al., 2021, Chapters 5, 6, and 7

Important Dates

- Problem Set #2 will be available on 2/20 (due before the start of class on 2/27)
- Quiz #2 will be available on 2/27 (due before the start of class on 3/6)

Coming up: Spring break (wooooo!) starts on 3/13

Part IV: Statistical Inference (10/22-11/28)

Agresti et al., 2021, Chapters 8 and 9

Important Dates

- Problem Set #3 will be available on 3/27 (due before the start of class on 4/3)
- Quiz #3 will be available on 4/3 (due before the start of class on 4/10)

Part V: Bivariate Statistics (4/10-4/24)

Agresti et al., 2021, Chapters 3, 10, and 11

Important Dates

- Problem Set #4 will be available on 4/17 (due before the start of class on 4/24)
- Quiz #4 will be available on 4/24 (due by 11am on Monday, 5/1)