PAF 301 Applied Statistics

(Spring 2025; Session C; Online)

Please use this syllabus as your first resource for class-related questions.

Faculty Information

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Office Hours:

Mondays:	9 am to 10 am
Thursdays:	5 pm to 6 pm

And by appointment for any other dates and times

Please address me as Robin, Professor, or Mr., and he/him. I will gladly honor your request to address you by an alternate, chosen name or gender pronoun. Please advise me of this preference early in the semester so I may make appropriate changes to my records. **Please note**: You can change the name you display in some ASU systems, including Canvas, Email, and Google Apps. Learn more about preferred name displays here: https://registrar.asu.edu/forms/preferred-display-name.

Land Acknowledgement

Arizona State University acknowledges, with respect, that its physical locations are within the ancestral homelands of those American Indian tribes that have sustained connections to its lands and waters since time immemorial, including the Akimel O'odham (Pima), Pee Posh (Maricopa), Quechan (Yuma), and Tohono O'odham peoples.

Statement of Inclusion

Arizona State University is deeply committed to positioning itself as one of the great new universities by seeking to build excellence, enhance access and have an impact on our community, state, nation and the world. To do that requires our faculty and staff to reflect the intellectual, ethnic and cultural diversity of our nation and world so that our students learn from the broadest perspectives, and we engage in the advancement of knowledge with the most inclusive understanding possible of the issues we are addressing through our scholarly activities. We recognize that race and gender historically have been markers of diversity in institutions of higher education. However, at ASU, we believe that diversity includes additional categories such as socioeconomic background, religion, sexual orientation, gender identity, age, disability, veteran status, nationality, and intellectual perspective. At Watts College, we echo these sentiments through Our Aspirations to be a vehicle through which we make the world a better place.

Course Information

Course Catalog Description

This course focuses on statistical techniques used in social science research. Applies concepts such as measures of central tendency and dispersion as well as statistical techniques, including the following: one-sample z and t-tests, two-sample t-tests, chi-square, and correlation. Goals include helping students understand the mathematical and statistical concepts presented and assisting them in using these concepts in everyday life and the study of social sciences.

Course Enrollment Requirements

Prerequisite(s): MAT 142 or higher OR Visiting University Student

Course Learning Objectives

At the completion of the course, students will be able to:

1. Critically evaluate how basic statistics are employed to describe and analyze matters of public interest.
2. Locate, download, import, and analyze secondary data of public interest.
3. Explain how sampling is used to make conclusions about matters of public importance to a population.
4. Calculate commonly used statistics and construct and interpret visual displays of data.
5. Define and use the concept of probability.
6. Interpret bivariate and multivariate statistics for a lay audience.
7. Use software to manage data and calculate basic statistics.

Course Materials

Textbook

Required

Webb, R. (2021). Mostly Harmless Statistics (2nd ed.) Links to an external site.. Lulu.com.
Download free ebook Links to an external site.

The assigned chapter readings are provided within each Canvas module.

Optional

Arem, C. (2009). Conquering Your Math Anxiety, 3rd Ed. Cengage Learning.

Computer Requirements

- **Software**: Microsoft Excel and Analysis ToolPak. See Module 0 "Prep assignment" in Canvas for details.
- **Computer System:** Windows or Apple desktop or laptop computer manufactured within the last five years. Chromebooks and mobile devices will not provide full access to ASU's online courses.
- **Operating System:** Windows-based computers should be running the most recent version of Windows. Apple computers must be running a recent version of macOS. For operating systems recently released (the last few months), consider maintaining the next most recent release for a few months until bugs in the OS have been addressed.
- **Required Software:** Microsoft Office 365 (available for all students at ASU); Adobe Acrobat Reader DC (free)

- **Web Browser:** Use a recent version of Firefox or Chrome. Students are also advised to have both browsers installed on their computers.
- **Internet Connection:** Courses are best viewed with high-speed internet and a reliable internet connection.
- **Speakers and a microphone:** Built-in, USB plug-in, or wireless Bluetooth. A headset with a microphone is recommended for privacy and clarity of audio.
- **Webcam:** Built-in or USB plug-in

Detailed Requirements by Application:

- Canvas LMS computer requirements
- Zoom computer requirements

Need Help? Students needing help with technical issues can contact a 24/7 live chat service at contact.asu.edu or My ASU Service Center for help.

Assignments and Evaluation Procedures

Summary of Assignments and Exams

Assignments and Exams	Percentage/ Points
Assignment 0: Preparation: Install and Play with Excel	5%
Assignment 1: Statistics in Everyday Life	10%
Assignment 2: Statistics for an Informed Citizenry	10%
Assignment 3: Measuring and Describing the Social World	10%
Assignment 4: Probability: What is the Chance of That?	10%
Assignment 5: Making Inferences and Decisions	10%
Assignment 6: Relationships and Associations	10%
Assignment 7: Regression: Explanation is Complicated	15%
Exams (Midterm 1, Midterm 2, and the Final) *	20%
TOTAL	**100%**

**Only two exams will be counted toward your final grades; one of the lowest scores will be dropped.*

Reading and Media Assignments

The reading assignments must be completed *before* the class in order to be prepared for class that week. Not all of the assigned readings will be discussed in class; however, all assigned readings may be covered assignments.

Assignment 1:

The assignment for this module consists of two parts. One part will be completed in the quiz format (although it is not timed and open book), and the other part is a worksheet you will complete and upload. See Canvas for details.

Objectives:

1. Distinguish among retrospective, cross-sectional, prospective, and experimental research designs.
2. Explain and apply sampling approaches.
3. Use measures of concepts (i.e., variables) appropriately.
4. Identify and interpret visual displays of data.

Assignment 2: US Census Bureau Data

This assignment consists of two parts: a Word (or text) document and an Excel file. Both parts must be submitted. See Canvas for details.

Objectives:

1. Explain the role of the US Census and data collected by the US Census Bureau in public affairs.
2. Use US Census Bureau functions to collect data about the nation, a State, a county, and a municipality.
3. Enter data into Excel and use basic functions to present and manipulate the data.
4. Use the data and analysis in (2) and (3) above to write a one-page, data-informed comparative brief.

Assignment 3: State of Arizona Data: Measures of Center, Spread, and Placement

This assignment consists of two parts: a Word (or text) document and an Excel file. Both parts must be submitted. See Canvas for details.

Objectives

1. Calculate basic demographic statistics using Excel and US Census data.
2. Describe the state of Arizona using appropriate measures of central tendency.
3. Explain diversity in Arizona using appropriate measures of dispersion.

Assignment 4: Probability: What is the Chance of That?

The assignment consists of two parts: One part will be completed in the quiz format (although it is not timed and open book), and the other part is a worksheet you will complete and upload. See Canvas for details.

Objectives

1. Estimate probabilities.
2. Calculate Z-scores and use them to assess probability.
3. Review and use math rules to understand the logic of probability.
4. Define and use both theoretical and empirical probability.
5. Use logic and simple math to estimate empirical probabilities.
6. Explain in lay person's terms - key findings for a policy maker.

Assignment 5: Making Inferences and Decisions

This assignment consists of three parts: **Part 2** requires an Excel file, and **Parts 1 and 3** require a Word (or text) document. See Canvas for details.

Objectives

1. Construct confidence intervals around means and proportions.
2. Specify null and alternative hypotheses formally.
3. Use Excel to calculate and test your hypotheses.
4. Explain in lay person's terms - key findings for a policy maker.

Assignment 6: State of Arizona: Correlations

This assignment consists of three parts: **Part 1** requires an Excel file, and **Parts 2 and 3** require a Word (or text) document. See Canvas for details.

Objectives

1. Use Excel to calculate a correlation table of demographic data in Arizona Counties.
2. Interpret correlation coefficients with attention to magnitude, direction, and probability.
3. Explain in lay person's terms - key relationships for a policy maker.

Assignment 7: State of Arizona: Regression

This assignment consists of three parts: **Parts 1 and 3** require a Word (or text) document, and **Part 2** requires an Excel file. See Canvas for details.

Objectives

1. Develop a model to explain income variation in Arizona counties, including specifying formal hypothesis tests.
2. Use Excel to calculate regression coefficients, statistical significance, and model fit.
3. Report descriptive, bivariate (correlation), and regression results in tabular format.
4. Interpret estimates with attention to magnitude, direction, and probability.
5. Explain in lay person's terms - key relationships for a policy maker.

Submitting Assignments

All assignments, unless otherwise announced by the instructor, MUST be submitted via Canvas. Each assignment will have a DESIGNATED place to submit the assignment. DO NOT submit an assignment via email. Please make sure to include all assignment files with your submissions.

Exams

This iCourse has **three exams**. All exams will be open-booked but timed. For each test, you will have 120 minutes to complete 40 multiple-choice and true/ false questions on Canvas. You will have a 7-day window to decide when to take each test. However, only one attempt is allowed (once you start a test, you cannot pause and resume the timer). Taking exams after their dues is not allowed. Please plan your time wisely and carefully review and understand Canvas materials and assigned chapters before taking the exams. Only two tests will be counted toward your final grade. One of the lowest scores will be dropped.

Midterm 1: available from Feb. 18 (Tuesday) - Feb. 24 (Monday)

This test covers modules 0, 1, 2, and 3.

Midterm 2: available from Apr. 1 (Tuesday) - Apr. 7 (Monday)

This test covers modules 4 and 5.

The Final: available from May 3 (Saturday) - May 9 (Friday)

This test covers modules 6 and 7.

Grading

Grading Procedure

Grades reflect your performance on assignments and exams. Graded assignments will be available via the grade book within one week of the due date.

Grade Scale

This course uses a +/- grading system as defined below.

Grade	Percentage
A+	97.00 % – 100 %
A	94.00 % – 96.99 %
A-	90.00 % – 93.99 %
B+	87.00 % – 89.99 %
B	84.00 % – 86.99 %
B-	80.00 % – 83.99 %
C+	76.00 % – 79.99 %
C	70.00 % – 75.99 %
D	60.00 % – 69.99 %
E	Below 60.00%

*The Y (Satisfactory) grade may be an option for this class. This is in lieu of pass/fail and only applies to coursework with a C grade or better on a case-by-case basis. The Y grade does earn class credit but does not calculate your GPA. If you are considering requesting a Y grade, make an appointment to discuss this with your professor.

Pacing and Late Assignments

This is a fully online course. All of the material is available on the first day of class, as well as deadlines and rubrics. Work consistently through the semester and ask for help when you need it. I understand that life happens, so if you need any consideration regarding published deadlines, please email me to make other arrangements AT LEAST one day before publishing dues. Late assignment submissions without prior notice and permission from the instructor will be subject to a 5 %-point deduction for every day late.

Workload Expectations

The Arizona Board of Regents, the governing board for ASU, NAU, and the U of A, has a policy for how much time students should invest in their courses: "A minimum of 45 hours of work by each student is required for each unit of credit." Therefore, in a 3-credit course, students should expect to invest 45 hours in class meetings (or the online equivalent), as well as 90 hours doing homework and assignments—a total of 135 hours in any given session (A, B, or C). This translates to 9 hours per week for classes that meet over a 15 week-semester. For 7.5-week classes, the workload doubles to 18 hours per week, engaging in online activities, reading, doing other homework, completing assignments or assessments, and studying.

As you register for courses, keep this 135-hour standard in mind because, during some semesters, your work and/or family commitments may prevent you from taking a full load of classes.

Course Structure and Schedule

Please use the following schedule to plan your time for this course. We may slightly vary from the following schedule depending on the class pacing. Any changes to dues will be noted by the instructor on Canvas.

ACTIVITIES/ ASSIGNMENTS	POINTS	DUE DATE*
WEEK 1: Jan. 13 - Jan. 19 **MODULE 0: Introduction to the Course**		
Reading/Media: Syllabus	--	--
Obtain and Use Microsoft Excel and Analysis ToolPak	100	Jan. 19, 11:59 pm (Sunday)
WEEK 2: Jan. 20 - Jan. 26 (includes the Martin Luther King Jr. Day) **MODULE 1 [PART 1]: Data in Everyday Life**		
Reading/Media: Webb, Chapter 1	--	--
Assignment 1: Part 1	79	Jan. 27
WEEK 3: Jan. 27 - Feb. 2 **MODULE 1 [PART 2]: Visual Displays of Data**		
Reading/Media: Webb, Chapter 2	--	--
Assignment 1: Part 2	15	Feb. 3
WEEK 4: Feb. 3 - Feb. 9 **MODULE 2: Statistics for an Informed Citizenry**		
Reading/Media: Canvas videos and materials	--	--
Assignment 2	100	Feb. 10
WEEK 5: Feb. 10- Feb. 16 **MODULE 3: Measuring and Describing the Social World**		
Reading/Media: Webb, Chapter 3, and Canvas videos	--	--
Assignment 3	100	Feb. 17
WEEK 6: Feb. 17- Feb. 23 Midterm 1**		
Midterm 1: Canvas	100	Feb. 24
WEEK 7: Feb. 24 - Mar. 2 **MODULE 4 [PART 1]: Probability: What is the Chance of That?**		
Reading/Media: Webb, Chapter 4 and Canvas videos	--	--
Assignment 4: Part 1	55	Mar. 3
WEEK 8 & WEEK 9: Mar. 3 - Mar. 16 (includes the Spring Break) **MODULE 4 [PART 2]: Probability Distributions**		
Reading/Media: Webb, Chapter 6 and Canvas videos	--	--
Assignment 4: Part 2	45	Mar. 17
WEEK 10: Mar. 17 - Mar. 23 **MODULE 5 [PART 1]: Confidence for What?**		
Reading/Media: Webb, Chapters 7 and 8 and Canvas videos	--	--
Assignment 5: Part 1 ***	150 for all parts	Advice to finish by Mar. 24
WEEK 11: Mar. 24 - Mar. 30 **MODULE 5 [PART 2]: Testing Hypothesis**		
Reading/Media: Webb, Chapter 9 and Canvas videos		
Assignment 5: Part 2 and Part 3	150 for all parts	Mar. 31
WEEK 12: Mar. 31 - Apr. 6 Midterm 2**		
Midterm 2: Canvas	100	Apr. 7
WEEK 13: Apr. 7 - Apr. 13 **MODULE 6 [PART 1]: Describing Relationships**		
Reading/Media: Webb, Chapters 10, 11, and 12 Section 12.1 and Canvas videos	--	--
Assignment 6: Part 1	150 for all parts	Advice to finish by Apr. 14
WEEK 14: Apr. 14 - Apr. 20 **MODULE 6 [PART 2]: Correlation**		
Reading/Media: Webb, Chapter 12, Section 12.1 and		

Canvas videos (continued)		
Assignment 6: Part 2 and Part 3	150 for all parts	Apr. 21
WEEK 15 & WEEK 16: Apr. 21 - May 2 **MODULE 7: Explaining Regressions**		
Reading/Media: Webb, Chapter 12, Sections 12.2 and 12.3 and Canvas videos	--	--
Assignment 7	150	May 2, 11:59 pm (Friday)
WEEK 17: May 3 - May 9 Final Exam**		
Final Exam: Canvas	100	May 9, 11:59 pm (Friday)

* Assignments and exams are **due every Monday at 11:59 pm unless otherwise noted**.

** Midterm 1 and Midterm 2 will be available on Canvas Tuesday at 11:59 pm of the assigned week. The final Exam will be available on Canvas from May 2, 11:59 pm to May 9, 11:59 pm.

*** No strict deadlines for Assignment 5 Part 1 and Assignment 6 Part 1, but completing them by the suggested dates is strongly advisable. Assignments 5 and 6 grades are based on all three parts (all parts are nested under Assignments 5 and 6 on Canvas).

Course Policies

For information regarding course and college policies, please refer to the Course Policies link on the course menu. **Students are responsible for reviewing and complying with all ASU policies**. **Please read these policies carefully.** On this page, you will find important information related to the following:

- Academic Integrity
- Accessibility
- Attendance and Accommodations
- Conduct
- Student Success Resources

Citation Style

Students are required to use the citation style and format of the American Psychological Association (APA). Review the APA Referencing and Citation Guide or the APA Citation Style tutorial. It is acceptable to cite legal materials (cases, statutes, regulations, etc.) in accordance with the style specified in *The Bluebook: A Uniform System of Citation* in all papers.

Drop and Add Dates/ Withdrawals

This course adheres to a schedule and may be part of a sequenced program, therefore, there is a limited timeline to drop or add the course. Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: Withdrawal from Classes, Medical/Compassionate Withdrawal, and a Grade of Incomplete.

Email

ASU email is an official means of communication among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly. ***All instructor correspondence will be sent to your ASU email account. IMPORTANT: Please ensure Canvas notifications are being sent to your email.***

Extra Credit

There is no extra credit offered in this class.

Generative AI

Generative Artificial Intelligence (GenAI) is a form of artificial intelligence that can create high-quality audio, images, text, video, 3D models and other content. GenAI programs are not a replacement for human creativity, originality, and critical thinking. While adhering to any policies on the use of GenAI in this course, students utilizing GenAI content in their assignments, including in their practicum placements, must provide clear and comprehensive descriptions of the GenAI used. Students utilizing GenAI techniques should be aware of potential ethical implications and must adhere to relevant ethical guidelines and ensure that their work respects privacy and confidentiality. If the scholarly work involves human subjects, appropriate informed consent procedures must be followed. Scholarly work must be the student's own, and not present others' ideas, data, words or other material without adequate citation, i.e., any use of GenAI must not breach academic integrity

and plagiarism standards. Students should be cautious of incorrect or inaccurate information, as well as bias in GenAI generated content; the use of person-first and bias-free language is critical. Review, fact-check, and edit material produced by GenAI. The student is ultimately accountable for all submitted work.

Please adhere to the following policy when using GenAI in this course:

> GenAI may not be used for course assignments except as explicitly authorized by the instructor. The following actions are prohibited in this course:
>
> - Incorporating any part of an GenAI generated response in an assignment.
> - Using GenAI to brainstorm, formulate arguments, or template ideas for assignments.
> - Using GenAI to summarize or contextualize source materials.

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule, but the possibility exists that unforeseen events will make syllabus changes necessary. Please remember to check your ASU email and the course site often.

Course Conduct: Expectation of Professional Behavior

In addition to the Watts Conduct Policies, respectful conversations and tolerance of others' opinions will be strictly enforced. Any inappropriate language, threatening, harassing, or otherwise inappropriate behavior during discussion could result in the student(s) being administratively dropped from the course with no refund, per ASU policy USI 201-10 (http://www.asu.edu/aad/manuals/usi).

Students are required to adhere to the behavior standards listed in the Arizona Board of Regents Policy Manual Chapter V—Campus and Student Affairs (http://azregents.asu.edu/rrc/Policy%20Manual/5-308-Student%20Code%20of%20Conduct.pdf).

Copyright

Students must refrain from uploading to any course shell, discussion board, or website used by the instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on grounds of suspected copyright infringement.

All course content, including lectures, are copyrighted materials. Students may not share outside the class, upload, sell, or distribute course content.

Prohibition of Commercial Note Taking Services:

In accordance with ACD 304-06 Commercial Note Taking Services, written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the notetaker's name as well as the instructor's name, the course number, and the date.

Warning of Course Content

At times, we may discuss material that may be disturbing—even traumatizing—to some students. This may include strong language (including swear words); graphic descriptions of or extensive

discussions of crimes, victimization (including suicide, homicide, rape and sexual abuse, kidnapping, violent assaults, and drug abuse), or disaster scenarios; and depiction or discussion of discriminatory attitudes or actions. If you have experienced criminal victimization or some other type of trauma in your past, you should feel free to excuse yourself from the classroom during a discussion that causes you to experience distress. You will, however, be responsible for any material you miss or, alternatively, for an alternate assignment if you are unable to engage with the material. If you suffer from some form of post-traumatic stress that may be triggered by discussion of material, you are encouraged to formulate a plan for treatment with the relevant health advisers to work on preventing unexpected reactions to potentially triggering material. ASU student counseling services can be reached Monday through Friday from 8am to 5pm at 602-496-1155 or in the Historic Post Office Building, Suite 208. There is also a 24-hour ASU-dedicated crisis hotline at 480-921-1006.

Keep in mind that some discomfort is inevitable in classes because the goals of higher education include exposing students to new ideas; having students question beliefs they have taken for granted and grapple with ethical problems they have never considered; and, more generally, expanding their horizons so as to become informed and responsible democratic citizens. You may become frustrated from time to time as you struggle with viewpoints that differ from your own. Even if you have previously experienced some form of trauma or victimization, this course may offer you the benefit of helping to understand behaviors in a manner that allows you to process what may have occurred in your past and move forward in your recovery.

Course Evaluation

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

