PSYC 652: Analysis of Variance

**Thursdays 4:30-7:10 pm, Robinson Hall B205**

Instructor Information:

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Office: David King Hall 2059 Phone: (703) 993-5187

Office Hours: Thursdays from 11:00a-12:00p or by appointment

Course Description:

PSYC652 will cover a breadth of analysis of variance (ANOVA) statistical designs including between subjects, within subjects, mixed designs, and designs with random factors. Students will learn the theoretical rationale and methods to compute analysis of variance, report results, and read and critique published studies that utilize ANOVA. Students are expected to leave this course with the ability to:

1. Compute a variety of ANOVA designs by hand
2. Conduct a variety of ANOVA designs using computer software
3. Understand the theoretical basis for ANOVA
4. Identify ANOVA designs from descriptions of experiments
5. Utilize ANOVA to analyze data and present the results of a research study

Course Format:

This course will be structured as a combination of interactive lectures and hands-on practice with statistical software. Occasionally, the entirety of the class period will be dedicated to hands-on activities. Students are expected to have completed the assigned readings and engage with questions or comments. Students will be regularly asked to participate in exercises and discussions.

Required Readings:

* Keppel, G., & Wickens, T. D. (2004). Design and Analysis: A Researcher’s Handbook (4th Edition). Englewood Cliffs, New Jersey: Prentice Hall.
* Nicol, A. A. M, & Pexman, P. M. (2010). Presenting Your Findings: A Practical Guide for Creating Tables. Washington DC: APA.

Additional handouts and supplemental readings will be provided to students on the Blackboard course website.

A Note about Prerequisites:

I will assume that students have taken a general introductory graduate statistics course (i.e., PSYC611 or equivalent). Students who do not feel confident in their general understanding of inferential statistics, including measures of central tendency, variability, t-tests, and correlations, may want to consider brushing up on these topics prior to the start of the semester.

Technology Requirements:

A Blackboard course site will be used to provide readings and course-related announcements; students are advised to check Blackboard at least twice each week. ALL ASSIGNMENTS WILL BE ADMINISTRED AND UPLOADED THROUGH BLACKBOARD. Further, students are required to use their MasonLive email accounts when communicating with the instructor about course-related matters. I will not send course information or updates to any email address other than those supported by GMU. Please **include “PSYC652” in the subject line of your email**. When sending a course related email, please “indicate ANOVA\_652” somewhere in the SUBJECT LINE.

There are many statistical software packages available. Although students are encouraged to learn a variety of software, **analyses for this course will be taught and conducted in SPSS**. Students are required to find access to the software inside and outside of class for the purpose of practicing the skills taught in this course. SPSS is available in most Mason computer labs/classrooms and on Mason’s Virtual Computing Lab.

Course Requirements and Assignments:

Grades for this course will come from three areas, including Blackboard Discussion Board Threads/ activities, homework assignments, and a final project. There are no exams. Each of these is discussed at greater length below:

1. **Blackboard Threads/SPSS activities**– 20%

There will be an assignment due on most weeks. Some of those assignments will consist of homeworks (see below). On the weeks that there are no homeworks, there will be either a blackboard thread or an SPSS activity. The blackboard assignments will be more conceptual/theoretical/philosophical. The instructor will post a prompt on the Discussion board

and students will respond directly to that prompt. Word limitations will apply. Other weeks, there will be an activity to complete, sometimes requiring the use of SPSS.

1. **Homework** –50%

Students will complete approximately six homework assignments throughout the course. These assignments will be used to assess students’ understanding of the course content and, as such, may contain conceptual questions, hand calculations, analyses conducted in SPSS, or a combination of the above. Tentative due dates are listed on the schedule below, but may change depending on the pace with which material is covered in the course. I will not accept late assignments.

1. **Final Project**– 30%

Students are required to complete a final project in which they will write up and present a small research study using analysis of variance on an existing data set. This project will be conducted in three parts: an initial written project proposal, a project poster, and a class presentation. Separate instructions and grading rubrics will be provided for each of these portions of the final project.

NOTE: If class must be cancelled, the instructor will send notification to your email via blackboard

Grading Procedures:

Final grades will be determined using the following criteria:

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| --- | --- | --- | --- |
| A: > 93% | B: 87-83% | C: 77-73% | D: 67-63% |
| A-: 92-90% | B-: 82-80% | C-: 72-70% | D-: 62-60% |
| B+: 89-88% | C+: 79-78% | D+: 69-68% | F: <60% |

Talk to me as soon as possible if you have concerns about your performance or the accuracy of your grades. **Please do not wait until the end of the semester!**

Honor Code:

The integrity of the University community is affected by the individual choices made by each of us. GMU has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (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; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough 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, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using APA format. A simple listing of books or articles is not sufficient. 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 see me. I reserve the right to enter a failing grade to any student found guilty of an honor code violation.*(Statement adapted from The Office of Academic Integrity;* [*http://oai.gmu.edu*](http://oai.gmu.edu)*)*

Other University Policies:

The University deadlines for adding and dropping courses are as follows:

Last day to **add** classes: January 28, 2020

Last day to **drop** classes with no tuition penalty: February 5, 2020

Last day to **drop** classes with no tuition refund: February 11, 2020

University Catalog: <http://catalog.gmu.edu/>

University Policies: <http://universitypolicy.gmu.edu>

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474, http://ods.gmu.edu. All academic accommodations must be arranged through the ODS.

George Mason University promotes a learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. For more information about diversity at Mason, visit <http://diversity.gmu.edu>.

Additional Mason Resources:

George Mason University also has a number of academic support and other resources to facilitate student success. Please reference the following links for more information about these resources.

Counseling and Psychological Services: <http://caps.gmu.edu>

Learning Services: <http://caps.gmu.edu/learningservices>

University Career Services: <http://careers.gmu.edu>

Writing Center: <http://writingcenter.gmu.edu>

Graduate and Professional Student Association: <http://gapsa.gmu.edu>

A Note about Scheduling and Dates:

The topics and dates (including the due dates of assignments) listed on the course calendar are tentative and may be changed as necessary to adapt to the pace of the class and students’ understanding of the material.

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| PSYC652: Analysis of Variance | | |
| Course Calendar | | |
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| Week 1: Jan 20-24, 2020 | | |
|  | Topics: Introduction, | |
|  | Required Readings: Syllabus | |
|  | Assignments Due: Demographics sheet (Ungraded) | |
| Week 2: Jan 27 – Jan 31, 2020 | | |
|  | Topics: Introduction, History, Variability | |
|  | Required Readings: K&W: Chapter 1, Chapter 2 | |
|  | Assignments Due: **Discussion Board posting** | |
| Week 3: Feb 3 – Feb 7, 2020 | | |
|  | Topics: Sampling distributions, t-test, One-way between subjects ANOVA, Analytic comparisons | |
|  | Required Readings: K&W: Chapter 3, Chapter 4, APA: Chapter 9, pgs. 51-53 | |
|  | Assignments Due: **SPSS guide/activity** | |
| Week 4: Feb 10 – Feb 14. 2020 | | |
|  | Topics: Analytic Comparisons and Trend Analysis | |
|  | Required Readings: K&W: Chapter 4 (continued), Chapter 5 | |
|  | Assignments Due: **Homework 1a** | |
| Week 5: Feb 17 – Feb 21, 2020 | | |
|  | Topics: Correction for Experimentwise Error Rates, Effect size, and Power | |
|  | Required Readings: K&W: Chapter 6, Chapter 8; APA: Chapter 6 | |
|  | Assignments Due: **Homework 1b** | |
| Week 6: Feb 24 – Feb 28, 2020 | | |
|  | Topics: Linear Model, Assumptions, Two-Factor Design | |
|  | Required Readings: K&W: Chapter 7, Chapter 10; APA: Chapter 9, pgs. 53-68 | |
|  | Assignments Due: **Homework 2a** | |
| Week 7: March 2 – March 6, 2020 | | |
|  | Topics: Factorial Design; Detailed Analysis of Main Effects and Simple Effects | |
|  | Required Readings: K&W: Chapter 11, 12, 13 | |
|  | Assignments Due: **Homework 2b (I will allow you to turn this in over the break)** | |
| Week 8: March 9 – March 13, 2020 | | |
|  | **SPRING BREAK – NO CLASS** | |
| Week 9: March 16 – March 20, 2020 | | |
|  | | Topics: Analysis of Covariance |
|  | | Required Readings: K&W: Chapter 15; APA: Chapter 11 |
|  | | Assignments Due:  **Final Project Proposal due by email March 22** |
| Week 10: March 23 – March 27, 2020 | | |
|  | Topics: The Within-Subjects Design | |
|  | Required Readings: K&W: Chapter 16, Chapter 17 | |
|  | Assignments Due: **Homework 3** | |
| Week 11: March 30 – April 3, 2020 | | |
|  | Topics: The Within-Subjects Design, continued | |
|  | Required Readings: K&W: Chapter 17 (continued), Chapter 18 | |
|  | Assignments Due: **Homework 4** | |
| Week 12: Apr 6 – Apr 10, 2020 | | |
|  | Topics: Mixed Designs | |
|  | Required Readings: K&W: Chapter 19, Chapter 20; APA: Chapter 9, pgs. 69-71 | |
|  | Assignments Due: **Activity** | |
| Week 13: Apr 13 – Apr 17, 2020 | | |
|  | Topics: Multivariate Analysis of Variance | |
|  | Required Readings: Haase& Ellis, 1987; Maroof, 2012; APA: Chapter 10 | |
|  | Assignments Due: **Discussion Board Posting** | |
| Week 14: Apr 20 – apr 24, 2020 | | |
|  | Topics: Final Presentations—In class | |
|  | Required Readings: TBD | |
|  | Assignments Due: **Final Poster Presentations** | |
| Week 15: Apr 27 – May 1, 2020 | | |
|  | Topics: Final Presentations---In class | |
|  | Required Readings: | |
|  | Assignments Due: **Final Poster Presentations** | |
| Finals Week: May 8- May 15, 2020 | | |
|  | Assignments Due: **Final Poster, after edits (due by 5pm on May 7)** | |