# DESIGN AND ANALYSIS IN EDUCATION II

# (ERMA 7310)

# Spring 2021

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Class hours: Mondays, 5PM (optional) Email: kks0013@auburn.edu

Office hours: By appointment using provided link Office Address: 4018 Haley Center

## **COURSE DESCRIPTION:**

Bivariate and multiple correlation and regression analysis, trend analysis, analysis of covariance, and logistic regression, as they are utilized in educational research.

## **COURSE OVERVIEW:**

The purpose of this course is to advance students’ experience with the process of research design and statistical analysis in education. On completion of the course, students will be able to: 1) explain the process of hypothesis testing and apply to research problems; 2) identify different types of research designs and variables found in published articles; 3) describe the strengths and limitations of different research designs; 4) identify applications of a variety of statistical procedures; 5) solve educational research problems using statistical tests of significance; 6) understand and apply various effect size estimates; 7) make accurate interpretations of statistical findings; 8) use data analysis software to assist in solving statistical problems; 9) prepare a written summary of data analysis results in APA format.

## **COURSE OBJECTIVES:**

1. To develop an understanding of correlation and regression as statistical methods for understanding behavioral, social, psychological, and educational phenomena.
2. To understand the underlying mathematical principles and procedures involved in regression methods for statistical analysis.
3. To appropriately apply regression to research problems and understand its application to real-world research.
4. To develop analytic and interpretive skills as related to regression methods necessary for independent research and for independent critique and understanding of others’ research.

## **COURSE MATERIALS:**

Recommended textbooks:

Kahane, L. H. (2008). *Regression basics* (2nd ed.). Thousand Oaks, CA: SAGE.

American Psychological Association. (2019). *Publication manual of the American Psychological Association* (7th ed.). Washington, DC: Author.

Other course readings are required and will be posted on Canvas.

Required software:

Students are required to have access to SPSS throughout the course. Student can access SPSS free of charge through Auburn University by using either an on-campus computer lab, or by accessing the Auburn College of Education Virtual Lab. The Virtual Lab can be accessed at <https://horizon.auburn.edu/>. That system uses the AU Access credentials and requires DUO two-factor authentication. Another option available to students is to purchase a student version of SPSS. A list of available vendors can be found at <https://www.ibm.com/products/spss-statistics-gradpack/details>. Students choosing to purchase a license for their personal computer should purchase the GradPack Standard or GradPack Premium license (do **not** purchase the “Base” version as it does not include several of the analyses covered in this class).

## **COURSE ASSIGNMENTS:**

1. **Projects:** Throughout the course, you will complete projects designed to expand your understanding of design and analysis concepts, and apply them to educational research problems. Directions for these projects are provided separately. Students are **not** encouraged to ‘work ahead’ as each project builds on concepts learned in class during the assigned week. Each project will be worth 100 points, and there will be a total of six projects.

**Group Work:** Students are encouraged to work on projects in small groups (about 3 per group). If you opt for group work, you will be asked to identify your group members in Week 2 and can identify group membership changes after the first exam. Groups will turn in only one assignment for the group, and all group members will be assigned the same grade. This process models the experience of co-authoring research manuscripts with peers, and may help you improve your skills via collaboration. However, you may also choose to do all of your projects individually (to be a ‘group of one’).

1. **Exams:** There are two exams in this course, each worth 250 points (25% of the final course grade). Exams will be administered on Canvas. You may use your textbook, notes, copies of your projects, and feedback from the instructor. However, group work on exams is absolutely prohibited, as is any kind of collaboration or sharing of materials. Any collaboration, sharing, copying, or ‘helping’ on exams will result in an automatic grade of ‘zero’ on the exam, and will be regarded as academic misconduct. Exams are timed, and must be completed within the allotted time, as well as before the deadline (e.g., if the due date is 11:59PM, and you have 120 minutes to complete the exam, you must start the exam no later than 9:59PM or you will not have the full time). Exam content will be reviewed in the week prior to each exam during a brief review session, but roughly follows the content of the course, and will include multiple-choice, fill-in-the-blank, and essay items.

## **GRADING STRUCTURE/REQUIREMENTS:**

There are a total of 1000 points in the course, which means you can take your total points and divide by ten to determine your percentage grade in the course. The grading structure is as follows:

|  |  |
| --- | --- |
| **Assignment Type** | **Total Points Possible** |
| Projects | 500 |
| Exams | 500 |
| **TOTAL POINTS** | **1000 points** |

The course is graded as follows: A = 1000-900, B = 899.9-800, C = 799.9-700, D = 699.9-600, F < 600.

## **CLASS PREPAREDNESS:**

Students are expected to be timely and prepared for required coursework. This means arriving prepared for in-class activities that may require the use of the textbook, spare paper, a calculator, and copies of out-of-class assignments. A standard, inexpensive calculator is all that is needed – any calculator that includes the square root (√) function is sufficient. Most cell phones have an adequate calculator built in. You may also wish to print copies of class notes that are pre-posted to Canvas to aid in understanding/note-taking.

## **CLASS ATTENDANCE:**

Class attendance is a key component of success in graduate-level coursework. As allowed by university policy, it is possible to earn course grade of failing due to excessive absences. For the purposes of this class, which does not have required synchronous meetings, an absence is defined as any class week during which a student does not complete all required work (including modules, self-check quizzes, and activities, as well as assignments) during that week. Students with three or more absences (other than university-approved excused absences) will receive a grade of failing due to excessive absences, regardless of scores on course assignments. Refer to the university attendance policy for information on attendance requirements and university-approved excused absences. Retain all documentation of university-approved excused absences – this documentation will only need to be turned in if you exceed three total absences. Note that a university-excused absence would need to apply to an entire class week to be considered valid.

This course offers optional Zoom meeting on Monday nights at 5:00PM. Note that those meetings are not required and do not factor into the attendance policy. The weekly optional meetings are meant to provide a time for live interaction, questions, further explanation, etc. There is no agenda or formal instructional plan for those meetings but are open to discuss the topics that arise for students in the class. In the event that public health considerations make offering in-person instruction possible later in the Spring semester, the meetings may move to a computer lab on campus but will also continue to offer a Zoom option. If those circumstances arise, the instructor will clearly communicate how to participate in writing via email. Again, participation in weekly meetings is completely optional, and all course content is covered in the weekly modules, videos, and activities.

## **LATE WORK POLICY:**

Late work is not acceptable in graduate work. However, if you find that you are falling behind in your coursework, it is of the utmost importance that you immediately contact your instructor. As soon as you know there is any problem, immediately contact the course instructor. This is the best way to stay caught up with the course, and to achieve the highest possible grade.

If you find that you need to submit late work **it is required that you contact the instructor before submitting any late work.** Any late work submitted without first contacting the instructor to discuss the work and form a plan for getting caught up to date with coursework will not be accepted. This is to make sure that you receive all information you need about which assignments will take priority in getting caught up, and what, if any, credit can be given to late work before beginning. Communication is the key in getting caught up if you find yourself behind on work, so call, email, or stop by, whatever you need to do to get in contact!

If any late work is accepted following communication with the instructor and establishment of a written plan, it will be worth a maximum of 50% of its graded point value. The exact percentage will be established in the written plan you make with the instructor.

## **TENTATIVE COURSE CALENDAR:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Readings** | **Content** | **Project** |
| 101/11/20 | Ch. 1, 1A | Introduction; Variance, covariance, and correlation |  |
| 201/18/20 | Ch 1, 1A | Introduction; Variance, covariance, and correlation, contd. NOTE: No Zoom meeting on 1/18 due to Martin Luther King Jr. Day. |  |
| 301/25/20 | Ch. 2, 2A, 2B | Simple linear regression |  |
| 402/01/20 | Ch. 4, 3A, 3B | Regression with two continuous predictors | Project 1 |
| 502/08/20 | Ch. 3, 4A | Regression with more than two continuous predictors |  |
| 602/15/20 | 5A | Regression with more than two continuous predictors, contd. | Project 2 |
| 702/22/20 | Ch. 7, 6A | Partial and semipartial correlation |  |
| 803/01/20 |  | **Exam One (taken on Canvas)**NOTE: No Zoom meeting on 3/1. | Exam due by 02/28/20 at 11:59PM |
| 903/08/20 | 8A, 8B | Stepwise regression models |  |
| 1003/15/20 |  | Hierarchical regression | Project 3 |
| 1103/22/20 | Ch. 5, 11A, 11B | Regression with one categorical predictor |  |
| 1203/29/20 | 12A | Regression with categorical and continuous predictors | Project 4 |
| 1304/05/20 | 13A, 13B | Analysis of covariance (ANCOVA) |  |
| 1404/12/20 | 14A | Path analysis | Project 5 |
| 1504/19/20 |  | **Final Exam (taken on Canvas)** | Exam due by 11:59PM on 04/26/20 |

*Note.* All readings other than the textbook can be found on Canvas listed under the number specified in the reading schedule. Other outside readings may be added to this schedule as needed.

## **POSSIBLE CHANGES TO THE SYLLABUS:**

This syllabus is your contract for production in the course. If changes are made to it they will be posted on Canvas and announced in class or by email. No changes increasing requirements will be made.

## **ADDITIONAL INFORMATION AND POLICIES:**

Graduate study requires a high level of independence, accountability, and conscientiousness in order to achieve success both in their program and in careers that require graduate study. As such, a number of guidelines are helpful that make clear the expectations of graduate students.

1. The Student Policy eHandbook applies to this course. Please review the eHandbook at http://www.auburn.edu/student\_info/student\_policies/
2. Grades associated with incomplete course work or withdrawal from class will be assigned in strict conformity to University policy (see Auburn University Bulletin). The University Registrar maintains a listing of dates by which you can withdraw from the course with no grade assignment, or withdraw with a grade of W.
3. The Department of EFLT recognizes university policy regarding academic misconduct. Violations include, but are not limited to: plagiarism, unauthorized assistance during examinations, submitting another’s work product as your own, using another’s words as your own without appropriate citation, sharing unauthorized materials with another that contain questions or answers to examinations, altering or attempting to alter assigned grades. In accordance with University policy regarding academic misconduct, students may be subject to several sanctions upon violations of the Student Academic Honesty Code. See the Tiger Cub publication for the current year for specifics regarding academic misconduct as well as student’s rights and responsibilities associated with the Code.
4. Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).
5. Students are expected to be in class for the entire class period every class meeting. If there is an unavoidable conflict (such as a professional conference that coincides with a class meeting) this should be communicated with the instructor as early as possible. In the event that you have a legitimate emergency that prevents you from attending class, you should: 1) contact the instructor by email immediately upon learning you will be unable to attend class (this should be before the class meets), 2) take appropriate steps to catch up with in-class learning opportunities, 3) ensure that all of your work that was due during that class meeting makes it to the instructor before the class meeting ends (email it, have a friend drop it by the office, etc.). Failure to be in class during an exam without agreement from and prior arrangements with the course instructor will result in a grade of zero on the exam.
6. Students are responsible for checking their student email account regularly for course announcements and course-related communications.
7. This course uses Canvas as a tool to manage course readings and other materials not included in the required texts for this course and for online course discussions. Students are expected to have a working knowledge of Canvas in order to access materials and participate in online course discussion.
8. My lectures and course materials, including power point presentations, tests, outlines, and similar materials, are protected by copyright. I am the exclusive owner of copyright to those materials I create. You may take notes and make copies of course materials for your own use. You may not and may not allow others to reproduce or distribute lecture notes and course materials *publicly* (whether or not a fee is charged) without my express written consent. Similarly, you own copyright to your original papers and exam essays. If I am interested in posting your answers or papers on the course web site, I will ask for your written permission.
9. Except in the case of an approved disability accommodation (see number 4 on this list), students **are not** **permitted** to audio or video record any portion of class. This policy, prohibiting the recording of class sessions, helps preserve an inclusive, friendly, and safe learning environment.