EME 6480: Quantitative Methods in Educational Technology Research

Educational Technology Program

School of Teaching and Learning · College of Education · University of Florida

CREDIT HOURS

3-credits hours

PREREQUISITES

An elementary statistics course would be helpful, but is not required. Proficiency with using modern operating systems (e.g., Windows 10) and productivity software (e.g., MS Excel).

COURSE DESCRIPTION

This is an applied quantitative methods course focused on examining educational technology research examples and problems. This course will provide you with the knowledge and skills needed to apply appropriate statistical methods to datasets, interpret results from statistical analyses of the datasets, and write the results in a manner appropriate for scholarly publication. Topics include a review of basic descriptive statistics, the logic of hypothesis testing, assumptions of statistical tests, various forms of t-tests, Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), factorial and repeated measures ANOVA, correlation, simple and multiple regression, Exploratory Factor Analysis (EFA), reliability analysis, and Multivariate Analysis of Variance (MANOVA). All statistical techniques are explored with real-world datasets addressing research problems in educational technology.

INSTRUCTIONAL METHOD

This is a fully online, [bichronous course (Links to an external site.)](#) with a variety of learning activities designed to facilitate your learning and mastery of the course learning outcomes. The course is organized into modules, each with a reading assignment, short instructional video(s), concept quizzes, discussions, and practice assignments. Additionally, there are two modules for the examinations in the course: mid-term examination, and final examination. In each module, you will complete the assigned

readings and watch the instructional videos to learn the materials and practice the statistical analysis techniques using SPSS. After, you will complete the concept quizzes, and practice assignments to demonstrate your learning. The instructor will provide additional synchronous support in the form of virtual office hours. You are encouraged to post questions to the discussion boards for each module in advance of the synchronous sessions.

INSTRUCTOR INFORMATION

Name: Albert Ritzhaupt, Ph.D.

Email: aritzhaupt@coe.ufl.edu

Website: http://www.aritzhaupt.com/ (Links to an external site.)

Office Phone: (352) 273-4180

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VIRTUAL OFFICE HOURS

I will schedule synchronous sessions using Zoom to provide additional support on completing the course activities and answering any questions. These synchronous sessions will be scheduled during scheduled virtual office hours shown in the table below. Please note that I will **not** provide additional support for the course examinations. Three of the sessions will include guest speakers on various course topics. You are encouraged to post relevant questions to the module discussion boards in advance of the meetings.

Date	Time Frame	Module	Guest Speaker
08/24/2021	6:00pm - 8:00pm	Module 1	Krista Vaught, Previous Ed.D. Cohort
09/07/2021	6:00pm - 8:00pm	Module 2	
09/21/2021	6:00pm - 8:00pm	Module 3	
10/05/2021	6:00pm - 8:00pm	Module 4	Florence Martin, Ph.D. (Links to an external site.)
10/26/2021	6:00pm - 8:00pm	Module 6	
11/09/2021	6:00pm - 8:00pm	Module 7	
11/23/2021	6:00pm - 8:00pm	Module 8	Lloyd Riber, Ph.D. (Links to an external site.)

COURSE OBJECTIVES

Upon successful completion of this course, students will:

- Demonstrate how to analyze educational technology datasets using both descriptive and inferential statistics, including t-test, Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), correlation, simple and multiple linear regression, exploratory factor analysis, reliability analysis, and Multivariate Analysis of Variance (MANOVA).
- Describe the assumptions (e.g., normality, homogeneity of variance, and independence of observation) of various statistical procedures, assess these assumptions using appropriate methods, and decide on actions for datasets that both meet these assumptions and violate these assumptions of a given educational technology dataset.
- Translate clearly defined research goals into a data analysis plan for a given dataset, execute the data analysis plan using appropriate statistical procedures and software, and disseminate the results of the data analysis following APA guidelines.

TEXTBOOK INFORMATION

Field, A. (2017). *Discovering statistics using IBM SPSS statistics: North American edition* (5th Ed.). Thousand Oaks, CA: Sage Publications. ISBN: 9781526436566.

Student Companion Website Resources: [https://edge.sagepub.com/field5e (Links to an external site.)](https://edge.sagepub.com/field5e)

American Psychological Association. (2020). *Publication manual of the American Psychological Association*. (7th Ed). Washington, DC: American Psychological Association. ISBN: 143383216X.

REQUIRED SOFTWARE/HARDWARE

You will need access to a modern computer with a reliable Internet connection and web browser. You will need access to a variety of software packages this semester: Microsoft Word, Microsoft Excel, and Microsoft PowerPoint 2010/13/16/19. Additionally, we will be using IBM SPSS Version 26 for most of the assignments and examinations. IBM SPSS can be accessed on the UF APPS server: [https://apps.ufl.edu (Links to an external site.)](https://apps.ufl.edu). The first module provides a video that instructs you how to connect and use the UF APPS server to access IBM SPSS.

COURSE DELIVERABLES

There are four primary forms of deliverables in this course: Discussions, Concept Quizzes, Practice Assignments, and Examinations. Each of the items has a hard deadline that will be

posted in advance and will not be adjusted. Please be sure to complete the activities in the prescribed sequence.

Discussions

There are three discussions within the course: 1) Introduction discussion, 2) Research design discussion, and 3) Instrument design discussion. The discussions are designed to engage student participants in the discourse around the quantitative methods we are learning and how they can be used in possible educational technology research. Each discussion will be evaluated on you collecting sources, grammar, posting one original thread with about 300+ words, and posting two meaningful responses to your peers' posts. **Original threads are due by the first Sunday of the course module**. This policy is exercised to ensure your peers have enough time to participate in a meaningful conversation.

Concept Quizzes

The concept quizzes are designed to make sure you are reading and mastering the textbook materials. All quizzes are available online within Canvas. While the practice assignments demonstrate your ability to do the work, the quizzes demonstrate your understanding and mastery of the content. Each quiz has 20 multiple-choice questions and has an unlimited time frame for you to complete the quiz. The items are designed to measure a variety of learning outcomes. You will only be allowed to take the quiz once - in a single sitting. To prepare for the quizzes, complete all of the reading materials and study the key concepts. The concept quizzes are auto-graded and provide immediate item-level feedback.

Practice Assignments

The practice assignments include multiple applied statistical analysis problems with real-world datasets addressing educational technology research problems. These are major individual deliverables in the course, and provide you a practice opportunity to achieve the learning outcomes. The practice assignments are closely aligned with the instructional videos, which demonstrate how to perform statistical analyses with similar datasets and research problems. These are designed to be individual learning experiences. You are welcome to discuss ideas and compare answers with your peers, but the materials you submit to the instructor must be representative of your individual effort. You are to turn in the required documents to Canvas by the date specified. All submissions must be formatted according to the most recent APA guidelines. The practice assignments will be graded within a one-week period using the rubric shown.

Examinations

There will be two examinations during the semester: a mid-term examination, and a final examination. The exams will cover material from the readings, quizzes, instructional videos, and practice assignments. The examinations are take-home exam formats with open books and notes. The exams will present a dataset and a research goal along with several questions you will be required to answer. Your objective will be to select the appropriate statistical analysis technique to examine the dataset, check for all statistical assumptions, and report the results in an APA format. Additionally, you should provide answers to the free-form questions posed. The examinations will be graded within a two-week period to ensure timely feedback.

GRADING SCALE

Discussions (3)	10%
Concept Quizzes (7)	15%
Practice Assignments (7)	35%
Mid-Term Examination (1)	20%
Final Examination (1)	20%
TOTAL	**100%**
Extra Credit Module (1)	5%
FINAL TOTAL	**105%**

Range	Letter Grade	Performance Level
93% - 100%	A	Excellent performance
90% - 92%	A-	
87% - 89%	B+	
83% - 86%	B	Good performance

80% - 82%	B-	
77% - 79%	C+	
73% - 76%	C	Fair performance
70% - 72%	C-	
67% - 69%	D+	
63% - 66%	D	Poor performance
60% - 62%	D-	
< 60%	E	

Note: A grade of an 'I' will not be awarded unless there are extenuating circumstances.

COURSE POLICIES

Communication

Each module has a designated discussion forum for questions about the module's contents. Students are expected to post their questions about the course contents to the designated module discussion forum. Students are allowed to assist each other in these discussion forums. Additionally, the instructor will monitor activity and provide timely responses to student questions. Personal matters should be directed to the instructor using Canvas messaging. Students are expected to practice professionalism in their communication with their peers and the instructor. This means communications should be respectful and clearly articulated with complete sentences. Please be sure to follow this format for course communications and interactions.

Attendance

Students are expected to attend all of their scheduled classes and to satisfy all course objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, who reserves the right to deal with individual cases of nonattendance. In

an online course, this means logging into the Learning Management System frequently and spending an appropriate amount of time interacting with course materials, along with completing course activities in the sequences prescribed. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: [https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/ (Links to an external site.)](https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/).   (Links to an external site.)

Late Work

In order to receive full credit for work, students must turn in required deliverables on the specified due date. Late work will not be accepted unless you fall under the special circumstances (e.g., religious holidays, military duty, etc.). Read the link above under attendance. You are welcome, however, to submit work early.

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office ([http://www.dso.ufl.edu/ (Links to an external site.)](http://www.dso.ufl.edu/)). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting an accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health

Students with academic concerns related to this course should contact the instructor in person or via email. Students also may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the UF Counseling & Wellness Center, 352-392-1575. Visit their website for more information: http://www.counseling.ufl.edu/. Also, crisis intervention is always available 24/7 from: Alachua County Crisis Center: (352) 264-6789.

Academic Integrity and Academic Honor Code

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. "   You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the

University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: [http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php (Links to an external site.)](http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php).

Sharing, Comparing, and Plagiarism

Students are allowed, and in fact, are encouraged to compare statistical outputs and interpretations of the practice assignments within the course. However, the written submission for the practice assignments must be representative of the student's individual work. Please do not post complete solutions to the discussion forum if you are stuck, or if you are attempting to provide assistance to a peer. Instead, be specific and ask specific questions and provide specific answers. Finally, the examinations within the course should not involve any sharing or comparing output or interpretations. Students are expected to be able to select the appropriate analyses for the examinations without the support of peers or the instructor. Individual questions about the examinations are to be directed to the instructor only via Canvas messages.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at [https://gatorevals.aa.ufl.edu/students/ (Links to an external site.)](https://gatorevals.aa.ufl.edu/students/). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [https://ufl.bluera.com/ufl/ (Links to an external site.)](https://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [https://gatorevals.aa.ufl.edu/public-results/ (Links to an external site.)](https://gatorevals.aa.ufl.edu/public-results/).

Acceptable Use Policy

Please read the University of Florida Acceptable Use Policy that can be found at [http://www.it.ufl.edu/policies/aupolicy.html (Links to an external site.)](http://www.it.ufl.edu/policies/aupolicy.html). You are expected to abide by this policy.

Software Use

All faculty, staff, and students of the University of Florida are required and expected to obey laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against the University policies and rules, disciplinary action will be taken as appropriate.

Class Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited.

To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040.