

**Quantitative Foundations of Educational Research
EDF 7403**

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Home:

Hours: Tuesday 3-5, Wednesday 12-1 & 5-6 (by appointment) e-mail: lwitta@mail.ucf.edu

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Description

Examination of appropriate methods in applied educational contexts. Consideration of analysis strategies for educational data with emphasis on identification and interpretation of findings.

Credit & Prerequisites:

This course provides three (3) semester hours of graduate credit. The student should have completed a recent introductory course in educational statistics (EDF6401) and research methods. It will be assumed students possess the research competencies cultivated in those courses.

Course Purpose:

This course is designed to add to the master's level introductory class in quantitative analysis for graduate students in education. Students will focus on the role of statistical analysis in a study and application of analytic procedures to experimental and non-experimental or post hoc studies. Emphasis will be placed on the relationship of analysis of variance procedures to multiple regression. Although primarily dealing with parametric data, non-parametric alternatives will also be examined.

This class will emphasize the importance of satisfying assumptions relevant to each statistical procedure, use of the appropriate analytic method, and interpretation of results. At the completion of the course students should have a good working knowledge of analytic procedures and the assumptions underlying specific procedures up through factorial designs. Although regression analysis is included in the schedule, students should not expect total comprehension of the complex methods and assumptions of regression methodology from one classroom presentation.

Students will perform their own statistical analyses on the personal computer using the SPSS computer program. The use of the computer will be approached as an aid to statistical analysis.

Textbook:

Shavelson, R. J. (1996). *Statistical Reasoning for the Behavioral Sciences* (3rd Ed.). Needham Heights, Massachusetts. (Required)

American Psychological Association. (2001). *Publication manual of the American Psychological Association*. (5th ed.). Washington, DC. Author. (Required)

Course Objectives:

This course is designed to develop the student's ability to determine the appropriate

(parametric or nonparametric) statistical procedure and perform the analysis of research data. Students should be able to identify which statistical procedure to use in a given research situation and either conduct the analysis by hand or perform the analysis utilizing the personal computer.

After completing this course, students should:

1. understand the role of statistical analysis in the research process.
2. consider assumptions underlying each statistical method and demonstrate knowledge of the implications of their violation.
3. select and perform the appropriate statistical test (parametric or nonparametric, independent or dependent) when presented with a research situation.
4. explain the association between the research question, the statistical method, the type of data, the assumptions, and appropriate vs inappropriate interpretation of results.
5. demonstrate a working knowledge of the SPSS software package.

Additional Course Information:

If a student has a disability that qualifies under the Americans with Disabilities Act and requires accommodations, he/she should contact the Office of Support Services for Students with Disabilities for information on appropriate policies and procedures.

The method used in this class is a modified mastery approach. If a student receives a B or lower on a homework assignment, this assignment may be corrected and resubmitted to attain a maximum of A-. Corrections must be submitted the week following return of the assignment. No assignments or corrections will be accepted following the date scheduled for presentation of the research study with the following exception. If it becomes apparent a student will receive a C in this class and there is prior evidence of an honest effort to learn and apply the knowledge from this class, additional work and/or re-submission of specific class work will be permitted at the request of the student. This work will be specifically tailored to the area of need and must be approved by the instructor.

Instructional strategies used in this class include lecture, group discussion/activities, class discussion/interaction, use of computer lab, demonstration, and student presentations. All students, regardless of race, gender, culture, and/or handicap, will be given equal opportunities to succeed in this class. Students are encouraged to develop a study related to their area of study and their specific cultural/gender interest.

This is a professionally oriented course. Attendance at each class is expected, but not required. Students absent from a class will be expected to obtain notes and/or assistance from other class participants.

Academic Integrity

This class abides by the Golden Rule
http://www.goldenrule.sdes.ucf.edu/11_behavior.html. Student performance

should comply with the standards detailed in the Academic Behavior section of the Golden Rule.

Plagiarism

Plagiarism is a Golden Rule violation, and plagiarism of any kind will not be tolerated. Every student is expected to do their own work and all the work produced will be expected to be completed in its entirety by the students who turned them in. It is your responsibility to understand how to cite work properly and to understand what does and does not constitute plagiarism. *ACADEMIC ACTION FOR ANY ACTS OF PLAGIARISM WILL RESULT IN AN IMMEDIATE FAILING GRADE IN THE COURSE* (regardless of how well or how poorly you are doing at the time). This is a zero-tolerance policy. There are NO second chances.

Student Computer Labs

Student computer labs have SPSS software and are available for student use. Please visit www.acs.ucf.edu to confirm hours of operation. Some are open later during the week and some are open during the weekend.

Classroom Building I, Room 101
Computer Center 2, Rooms 104 and 113
Business Administration I, Room 148

Evaluation:

You will be expected to complete ten assignments. These assignments are to be turned in and discussed with the class on the appropriate dates. Each assignment is designed to develop or reinforce your statistical skills. You will also be expected to complete a research study demonstrating competency in one of the statistical methods used in this class. The proposal is to be developed according to APA guidelines and will be formatted as a research report or journal article. You will take two examinations. The exams will consist of short essay questions, multiple choice questions, and analyses and interpretation using both the SPSS statistical package and hand calculations. The exams will be on the application of concepts and principles learned, both inside and outside the classroom. We will be covering a lot of material over the semester. The pace may seem somewhat fast and furious, but do not let it get you down!

This class is an intensive exposure to statistics and use of the personal computer for statistical analysis. Because information presented in this course builds on previously presented information, students will be expected to keep up with readings, assignments, and class activities. This class is time-consuming not only in assignments and readings, but in time required to consider models, problems, and concepts posed in the class. At times it may seem over-whelming. **HANG IN THERE**

Assignments will receive a letter grade. These grades will be recorded as:

A	100	<u>Acceptable Re-submission</u>
A-	90	90
B+	85	
B	80	
B-	75	

submission 70

Time-limits imposed on examinations in classes such as statistics tend to produce a high anxiety level. This, in turn, produces results that may not be valid. Consequently, the exams in this class will be a combination of take-home and in-class. You will choose the time you take the examinations and how much time you spend completing it. The only time limitation imposed will be the return of the exam the following week. The honor system will be in effect for these exams as well as the entire class.

Examinations will be a combination of closed (in-class) and open book/note/computer (take-home) exams. The closed book and open book portions will be clearly designated on the examination.

Closed book - Although it will probably not be needed, you may use a calculator - you may not use any statistical functions on the calculator, such as mean, variance, etc.

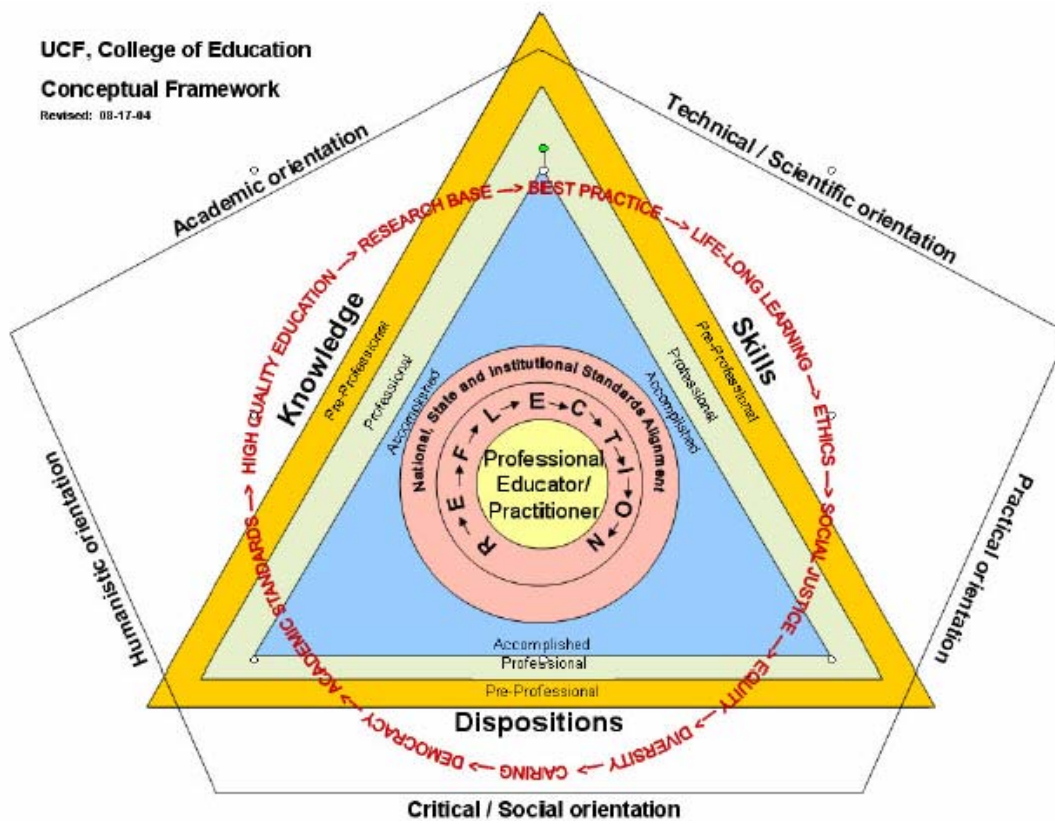
Open book - you may use any books, notes, and/or the computer (some parts will require computer use). You may not receive assistance from a friend or other person.

Class grades will be weighted as follows:

<u>Activity</u>	<u>Percent of Total</u>
Ten Assignments (2.5% each)	25%
Research Project	30%
Midterm Examination	23%
Final Examination	22%

Final Grades:

93 and above	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
70 - 79	C
<70	F



The graphical representation of our conceptual framework is based on basic geometric shapes that aptly portray key aspects of the framework:

- I. At the heart of the model are three concentric circles creating a "target" for graduates from all of our professional education programs. The core objective ("bull's eye") is becoming a **Professional Educator**, an achievement that requires continuous **reflective practice** (middle ring) and professional development aligned with applicable **national, state, and institutional standards** (outer ring).
- II. The outer pentagon of the conceptual framework represents **five broad orientations** regarding the preparation of professional educators (Academic, Teaching/Scientific, Practical, Critical/Social, and Humanistic), which serve as a broad foundation for the framework.
- III. Integrated throughout all aspects of our conceptual framework and thus reflected as a circle-in-motion is our **circle of core beliefs** (Research Base, Best Practice, Life-Long Learning, Ethics, Social Justice, Equity, Diversity, Caring, Democracy, Academic Standards, and High Quality Education).
- IV. Note that the triangle represents the three major dimensions of professional development: **Knowledge** (Subject Matter Pedagogy, Ethical Standards), **Skills** (Communication, Systematic Inquiry), and **Dispositions** (Professional Commitment, Professional Collaboration). The next three overlapping triangles represent three broad levels of professional development: **Pre-professional**, **Professional**, and **Accomplished** (note the physical progression indicating that professional development always moves in the direction toward Professional Educator).