Conceptual Framework

Mission

The mission of the Auburn University College of Education is to build a better future for individuals, our state, our nation and our world. We fulfill our mission by preparing competent, committed and reflective professionals as we engage in outstanding teaching, cutting-edge research and meaningful outreach.
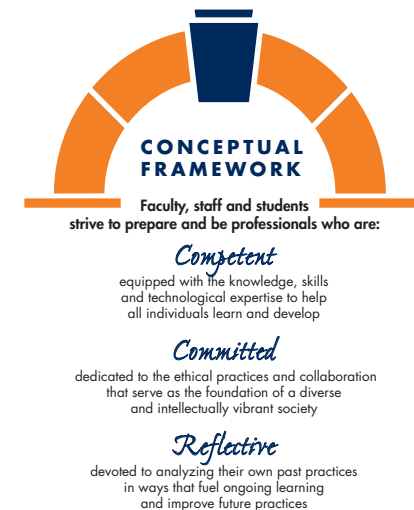
Vision

Our vision is one of transformation. We strive to be and prepare agents of change. We seek to establish and work collaboratively within socially responsive learning communities that value the mosaic of a diverse society. Our vision includes engaging in the continuous learning necessitated by a rapidly advancing world; identifying and addressing critical issues related to the education of all people; and using technology to broaden and support learning opportunities. Ours is a vision of change embracing the inclusive, collaborative and technological aspects of our mission, thereby establishing us as a college representing educational advocacy and innovation in the 21st century.

Philosophy, Purpose and Goals

Our philosophy of learning and teaching emphasizes that building a better future for all means creating learning environments for diverse learners that acknowledge the active, collaborative and ever-evolving nature of learning. This philosophy also values teaching that promotes the development of safe, stimulating learning communities enriched with diverse perspectives; is grounded in reasoned and purposeful decision making; and is enacted in proactive, flexible and self-regulating ways.

College of Education

CONCEPTUAL FRAMEWORK

Faculty, staff and students
strive to prepare and be professionals who are:

Competent
equipped with the knowledge, skills
and technological expertise to help
all individuals learn and develop

Committed
dedicated to the ethical practices and collaboration
that serve as the foundation of a diverse
and intellectually vibrant society

Reflective
devoted to analyzing their own past practices
in ways that fuel ongoing learning
and improve future practices

A Keystone in Building a Better Future for All

AUBURN
UNIVERSITY

Auburn University is an equal opportunity educational institution/employee

The keystone, the topmost stone of an arch, serves as a visual reminder of our mission and our goals. Just as the keystone supports and holds an arch together, education holds intact the promise of a better future for all. We believe that education is the keystone of opportunity and equity in a richly diverse, increasingly technological, and ever-changing world. It is the critical building block that enables individuals and societies to flourish in a global community.

1. **ERMA 7300**
       Design and Analysis I
       3 credit hours

2. **Semester FS 2011**
       Instructor: Margaret E. Ross
                               4018 Haley Center
                               (334) 844-3084   rossma1@mail.auburn.edu   (the first 1 = one)
       Office Hours: Tuesday 2:30 – 3:30 pm and Monday 2 - 4 pm or by appointment
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3. **Resources**

Required
Ross, M. E. & Shannon, D. M. (2011).   Handbook on Applied Quantitative Methods in Education (2nd ed).
       Kendall/Hunt, Publishing Company, Dubuque, Iowa.

Recommended
Publication Manual of the American Psychological Association (any recent edition). Washington D.C.,
       American Psychological Association.

(also see attached bibliography for other suggested texts and resources)

4. **Course Description**
This course is designed to provide students the understanding of statistical methods pertaining to the design and analysis of experiments in educational research. Descriptive statistics will be reviewed and inferential statistics used to analyze the relationship between one or more categorical variables and a continuous variable will be studied.   This course emphasizes the conceptual application of statistics with little emphasis placed on the mathematical derivation of the formulas. Emphasis will be placed on conceptual understanding of t-test and ANOVA designs, correctly identifying the proper statistical test, and interpreting the output using SPSS for Windows.

5. **Course Objectives**
Students will:
- Gain an understanding of inferential statistics.
- Apply knowledge of inferential statistics by analyzing research problems and making decisions about the appropriate use of inferential procedures.
- Apply knowledge of inferential statistics using SPSS to determine significance.
- Apply knowledge of inferential statistics by interpreting results of statistical analyses.
- Interpret the results of the analyses in terms of the research hypothesis

6. Tentative Course Content and Schedule

Class 1   8/22/11
Topics
       Introduction to the Course
       Basics of Statistics
       Authentic School Based **Project (a 'real' problem, issue or research deficit that needs to be addressed)**
Project Team Formation (2 per team)
Lab
Readings
    Text Introduction

Class 2   8/29/11
Review
Topics
       Introduction to Research Design
       Measures of Central Tendency (review)
       Measures of Variability (review)
       Distributions
       Overview of T-test and ANOVA designs
Team Project Planning/Guidance
Readings and Assignment
       Chapters 2 and 3
       Computer Activity/Lab - IRB modules   (due week 5)

Labor Day

Class 3   9/12/11
Review
Topics
    Validity and Reliability
    Internal/External validity
Prepare for Exam
IRB modules due class 5
Readings and Assignment
    Chapter 15

Class 4   9/19/11
Exam 1
Team Project Planning/Guidance
Assignment
       Outline of Team Project
       Possible Project Questions

Class 5   9/26/11
Class Discussion of Team Projects (project questions, data collection, analyses)
Topics
       Z-test and Hypothesis Testing (an eight step approach)
       One-sample t-test
IRB Modules Due
Project Planning/Guidance
Readings and Assignment
       Chapter 4
       Lab Activity

Research Article/Z-test or One-sample t-test

Class 6   10/3/11
Review and Article Discussion
Topics
      One-way ANOVA with two levels
      Independent Samples t-test
Project Planning/Guidance
Readings and Assignment
      Chapters 5
      Lab Activity
      Research Article/Independent Samples t-test

Class 7   10/10/11
Review and Article Discussion
Project Discussion
Topics
      One-way ANOVA with 3 or more groups
      Rubrics for authentic project distributed/discussed
Project Planning/Guidance
Readings and Assignment
      Chapter 6
      Lab Activity
      Research Article/One-Way ANOVA

Class 8   10/17/11
Review and Article Discussion
Topics
      Planned Comparisons (follow-up)
      Post-Hoc Comparisons
      Test Preparation
Project Planning/Guidance (<u>outline due next class</u>)
      Guidelines for outline points
            outline complete (2 points)
            research question appropriate for this class (2 points)
            writing mechanics (1 point)
            word choice (1 point)
            tone (1 point)
            organization and flow (1 point)
            APA (1 point)
Readings and Assignment
      Chapter 6
      Lab Activity
      Research Article/One-Way ANOVA with post-hoc Analyses

Class 9   10/24/11
Exam 2
Project Planning/Guidance (<u>outline due</u>)

Class 10   10/31/11
Review and Article Discussion
Topics
        Two-way ANOVA/Three-way ANOVA
        Follow-up analyses to multi-way ANOVA
        (simple effects, interaction contrasts)
Authentic Project Planning/Guidance
Project paper due week 12
Readings and Assignment
        Chapter 7
        Lab Activity
        Research Article/Two-Way ANOVA

Class 11   11/7/11
Review and Article Discussion
Topics
        Paired Sample t-test
        Within Subjects Designs
        Mixed Design
Project Planning/Guidance
Readings and Assignment
        Chapter 8
        Lab Activity
        Research Article/Paired Sample t-test or Within Subjects Design

Class 12   11/14/11
Review and Article Discussion
Topics
        Chi Square
        Binomial
Project paper due
Preparation for Exam

Class 13   11/28/11
Exam 3

Class 14   to be discussed
Roundtable Presentation with PowerPoint handout

7.   Course Requirements and Evaluation
Learning Methods
Lectures, discussions, readings, class exercises and lab assignments.

Student Assessment*

Three Tests	60% (10% test 1, 20% test 2, and 30% test 3)
IRB modules	10%
Authentic Research Project Paper	15%
Presentation**	10%
Assignments	05%

Labs will double as an assignments.   You can work in pairs on lab assignments and turn in one lab assignment per pair if you wish.   *You CANNOT make up more than two lab assignments.*

See next page for authentic research project outline of research project.

<div align="center">Introduction</div>

Introduction to the research and statement of significance of the problem or issue addressed
Literature review (very short)
Specific research questions to be answered.
> Are they clearly stated?
> Are they feasible/legitimate?
> Does it lend itself to t-test or ANOVA procedures?

<div align="center">Methodology</div>

Participants
Full description of participants

Measures
Instrumentation Description in detail (Validity and Reliability important here!)

Procedures
Procedures (detailed description of what you did – step by step)
Data processing and analysis (how will you analyze the data and why)?

<div align="center">Results</div>

Are **all** appropriate statistics clearly stated in APA style?
Are tables or graphs appropriately used?

<div align="center">Discussion</div>

Results in words
Results in light of past research/theory
Recommendations
Limitations discussed

A more detailed rubric will be handed out closer to the time the proposal and presentation are due.
The paper is to be written in APA style.

Grading Scale
A: 90 – 100%
B: 80 – 89%
C: 70 – 79%
D: 60 – 69%
F: below 60%

8. Class Policy Statements

Attendance Policy
- Excellent attendance is expected.
- I will start class on time so if you are late you will need to get notes from another student.
- I will allow only two lab make-ups.   If you miss more classes you will not be able to earn the points for the lab.

Late Assignments Policy
- Assignments turned in late will receive a 2% reduction in earned points per day.   The only exception will be in the case of emergency.
- Except for work requiring calculations, all work must be typed or it will **not** be graded.   Late penalty will be applied to work completed in writing and then turned in late in typed format for a grade.

Incompletes and Withdrawals
Grades associated with incomplete course work or withdrawal from class will be assigned in strict conformity to University policy (see Auburn University Bulletin).   If you wish to drop this course you may do so by the 10th class day with no grade assignment. From the 10th class day to mid-quarter a W (withdrawn-passing) grade will be recorded in your transcripts. After this period withdrawal from the course will only be granted under unusual circumstances and must be approved by the Dean of the College of Education.

Note that a new incomplete grade (IN) policy is in effect.   The new policy requires that students complete a form requesting that an IN grade be assigned.   If this form in not completed and given to the instructor of the class, a grade will be assigned with a score of zero (0) for work that has not been completed and turned in by the time the instructor reports grades.

Academic Misconduct
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.

Disability Accommodations
Students who need special accommodations in class, as provided for by the American Disabilities Act, should arrange a confidential meeting with the instructor during office hours the first week of classes - or as soon as possible if accommodations are needed   immediately. You must bring a copy of your Accommodation Memo and an Instructor Verification Form to the meeting.   If you do not have these forms but need accommodations, make an appointment with the Program for Students with Disabilities, 1244 Haley Center, 844-2096.

Bibliography

The following text books provide excellent overviews of analyses covered in this class.   These texts are also useful for further study in statistics and research design and/or as reference books.   You might check for later editions of the books.

Gravetter, Frederick J. & Wallnau, Larry B. (2002).   Essentials of Statistics for the Behavioral Sciences. Wadsworth.

Keppel, Geoffrey & Zedeck, Sheldon (1998).   Data Analysis for Research Designs. W. H. Freeman and Company, New York.

Maxwell, Scott E. & Delaney, Harold D.   Designing Experiments and Analyzing Data: A Model Comparison Perspective.   Lawrence Erlbaum Associates, Publishers, Mahwah, New Jersey

Meyers, Lawrence S., Gamst, Glenn, Guarino, A. J. (2006).   Applied Multivariate Research: Design and Interpretation.   Sage Publications.

Shavelson, Richard (1988).   Statistical Reasoning for the Behavioral Sciences.   Allyn and Bacon, Inc. Boston.