

**MARYVILLE UNIVERSITY**  
**Psychology/Sociology/CRIM 341 1M: Introduction to Statistical Inference**

Spring 2010

Instructor: Dr. Melissa E. Bleile, Ph.D.

Email: [mbleile@maryville.edu](mailto:mbleile@maryville.edu)

Classroom: ABAC 3249

Meeting Time: Alternate Thursdays 6:00 – 8:50 pm 1/21 – 4/29

3 CREDITS

Text: *Statistics for Psychology* by Aron, Aron, & Coups, 5<sup>th</sup> edition, Prentice Hall

### **Course Description**

The purpose of the course is to give students an introduction to the various topics usually covered in a first course in statistics. The course is designed to develop a conceptual and practical understanding of techniques used in descriptive and inferential statistics. Wherever possible the ideas are presented verbally rather than mathematically and are developed from a base of common understanding. The emphasis is on statistical concepts rather than computations.

### **Course Objectives**

At the end of this course the student should be able to:

- Understand, interpret and calculate basic descriptive statistics
- Understand, interpret and calculate basic inferential statistics
- Compute, analyze, and interpret data using computer software (e.g., SPSS).

### **Expectations**

It is expected that students will come to class having read and thought about the material scheduled for each class session. This implies being able to raise questions about the topics presented and statistical computations in the readings.

This course requires considerable review of material and practice with homework problems between the class meeting times. This is necessary for successful completion of the course.

### **About Your Instructor**

I have a very eclectic background. I am a registered nurse who went back to school during an early mid-life crisis. I completed my BA, MA, and PhD in experimental psychology at UMSL over a 10 year period. I have taught in full-time and adjunct roles at UMSL, Maryville University, and Fontbonne University. I have primarily taught statistics and research methods for psychology, sociology and health-related majors. My research interests are primarily in behavioral neuroscience, a specialty area examining the biological underpinnings of psychological disorders and behavior. I

currently work as a research nurse at St. Louis University and teach on an adjunct basis at UMSL and Maryville University.

## CLASS SCHEDULE

<b>DATES</b>	<b>CHAPTERS</b>	<b>TOPICS</b>
January 21	1	Preliminary concepts Descriptive and Inferential Statistics Presenting and summarizing data Frequency distributions; graphic presentation of data
	2	The mean and other measures of central tendency Variance and standard deviation
February 4	3	Normal curve Probability Populations versus samples
	4	Introduction to hypothesis testing Null and research hypotheses One and two tailed tests
February 18	<b>Exam 1 (Chapters 1 – 4)</b>	Chapters 1 – 4 homework due
	5	Hypothesis tests with means of samples The distribution of means Standard error Confidence intervals
March 4	6	Effect sizes Decision error Statistical power
	7	Introduction to the t-test T-test for dependent means
March 18	8	T-test for independent means
April 1	<b>Exam 2 (Chapters 5 – 8)</b>	Chapters 5 – 8 homework due
	9	Introduction to the analysis of variance (ANOVA)
	10	Factorial ANOVA

DATES	CHAPTERS	TOPICS
April 15	11	Correlation
	13	Chi-square tests for goodness of fit and independence
April 29	<b>Exam 3 (Chapters 9, 10, 11, 13)</b> Chapters 9, 10, 11, & 13 homework due	

### Grading standards:

A (93-100%); A- (90 – 92%); B+ (87 - 89%); B (83 – 86%);  
 B- (80 – 82%); C+ (77 – 79%); C (73-76%); C- (70 – 72%);  
 D+ (67 – 69%); D (63-66%); D- (60 – 62%); F (59% or lower)

Three exams: 100 points each; Homework 75 points (approximately 7 points per chapter); Attendance and class participation 25 points. Total semester points: 400

### Homework/Practice Problems:

Practice problems from the textbook are assigned as homework. Each chapter will be graded as complete or incomplete. Listed below are the assigned homework problems for each chapter. I have chosen problems from the text that most clearly and unambiguously demonstrate a statistical concept, principle or statistical technique. Be sure you do these questions and be sure you understand the underlying concepts.

**HOMEWORK WILL NOT BE ACCEPTED LATE.**

### Exams:

There will be 3 regular exams during the semester, each worth 100 points. Make-up exams will not be given **except under extreme circumstances**, and must be discussed with the instructor and approved **BEFORE** the time of the scheduled exam. You will be provided with a sheet of formulas for each exam, so do not worry about having to memorize them. You will also be allowed to use a calculator during exams.

**Don't forget to bring it!**

### Homework Assignments:

All homework is graded pass/fail. You must attempt **EVERY** problem assigned to get credit for that chapter, and show all work to receive credit for the homework.

Homework must be turned in to the instructor on the day of the exam covering that material or before. It is recommended that you turn in homework "early" because you will get written feedback in addition to the pass/fail grade. This may be very useful information for the exams. Also, if a problem is accidentally forgotten, you have time to correct it and still receive credit if it is turned back in on time.

Take advantage of class time offered to review homework questions. Feel free at any time to ask questions about homework or other problems related to the coursework.

**There are no stupid questions in this class—except one that you have but fail to ask!** Be sure to bring your textbook and calculator to every class meeting. We will work through computational problems together. Homework may be discussed in class.

**Attendance:**

One absence, excused or unexcused, will result in loss of the entire 25 points for attendance. Two absences, excused or unexcused, will result in AF (Failure due to Absence) grade for the course.

**Homework Practice Problems:**

**Chapter 1. Displaying the Order in a Group of Numbers**

**Problems:** 12, 13, 15, 16

**Chapter 2. Central Tendency and Variability**

**Problems:** 10, 12, 14, 16 ac, 18, 19

**Chapter 3. Some Key Ingredients for Inferential Statistics**

**Problems:** 13, 15, 18, 19, 20, 21, 22, 23

**Chapter 4. Introduction to Hypothesis Testing**

**Problems:** 11, 12, 13, 16, 17, 18

**Chapter 5. Hypothesis Tests with Means of Samples**

**Problems:** 12, 14, 16, 19 ad, 20 ad, 21 ad

**Chapter 6. Making Sense of Statistical Significance: Effect Size and Statistical Power**

**Problems:** 14, 15, 20. Additional problem: Define the terms alpha, beta, and power

**Chapter 7. Introduction to the t-Test**

**Problems:** 15 a, 17 a, 18 a, 20 a

Calculate effect sizes (Cohen's  $d$ ) for each problem as well.

**Chapter 8. The t-Test for Independent Means**

**Problems:** 14, 15, 17a, 18a, 19a. Calculate effect sizes (Cohen's  $d$ ) for problems 17, 18, & 19

**Chapter 9. Introduction to the Analysis of variance**

**Problems:** 16a, 17a, 18a

## **Chapter 10. Factorial Analysis of Variance**

**Problems:** TBA

## **Chapter 11. Correlation**

**Problems:** 12 abcdf, 13 abcdf, 16 abcd

## **Chapter 13. The Chi-Square Tests**

**Problems:** 13 ab, 15 a, 19 a, 20 a

**Note:** When a homework problem asks "Explain this procedure to someone who knows nothing about statistics" you do not have to do that part of the problem.

### **Courtesy Policies:**

Courtesy: "By showing respect for one another we demonstrate our maturity and make it possible for civil society to function." Consequently:

- Please turn off your cell phone before class begins.
- Do not chew or "pop" gum loudly in a way that could be distracting to fellow classmates.
- Do not get up and leave the classroom while class is in progress except in cases of real necessity.
- Do not carry on conversations while the professor is lecturing.
- When another student is asking questions, give him your full attention, as you would expect to be treated were you the one speaking or presenting.
- **Do not** spend class time on line. This can be very distracting to others in the classroom. Classroom computers and class time are to be utilized for learning the required material for class. You can spend time "surfing the net" on your own time.

### **Academic Honesty:**

Academic honesty is essential for the intellectual life of the university. Faculty members have a special obligation to expect high standards of academic honesty in all student work. Students have a special obligation to adhere to such standards. In all cases of academic dishonesty, the instructor shall make an academic judgment about the student's grade on that work and in that course. **The instructor shall report the alleged academic dishonesty as appropriate.**

The term **cheating** includes but is not limited to: (i) use of any unauthorized assistance in taking quizzes, tests, or examinations; (ii) dependence upon the aid of sources

beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (iii) acquisition or possession without permission of tests or other academic material belonging to a member of the University faculty or staff; or (iv) knowingly providing any unauthorized assistance to another student on quizzes, tests, or examinations.

The term **plagiarism** includes, but is not limited to: (i) use by paraphrase or direct quotation of the published or unpublished work of another person without fully and properly crediting the author with footnotes, citations or bibliographical reference; (ii) unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials; or (iii) unacknowledged use of original work/material that has been produced through collaboration with others without release in writing from collaborators.

This syllabus is subject to revision at the discretion of the instructor.