

EASTERN MICHIGAN UNIVERSITY

EDPS 651: Inferential Statistics

Winter, 2008

Syllabus

Instructor: Dr. Kyung-Hee Kim
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Office: 313I-A Porter
Office hours: Mondays: 3:30 pm – 5:00 pm on the Livonia Campus
 Wednesdays: 8: 30 am – 5:00 pm on the Main Campus
 By Appointment
Class: 5:00-6:50 on Mondays (Livonia)
Classroom: EMU Livonia (38777 West Six Mile, #400; Livonia, MI 48152; 734-542-4368)

Course Description:

The course is designed to explain how to compute and interpret statistical inferences given social science data. Substantial emphasis is placed on developing an understanding of hypothesis testing and point estimation as the basis of parametric inferential statistics (e.g., ANOVA and multiple regression).

Required Text:

Minium, E.W., Clarke, R.C, & Coladarci, T. (1999). *Elements of statistical reasoning*. New York, NY: John Wiley & Sons, Inc.
 Green, S.B. & Salkind, N.J. (2003). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*, 5th ed. Upper Saddle River, NJ: Pearson Education, Inc.
 Available at all campus bookstores

Recommended Text:

American Psychological Association (2001). *Publication manual of the American Psychological Association*, 5th ed. or 6th ed. Washington, DC: Author.
 Available at all campus bookstores

Required Equipment:

A calculator with a square root and squaring function. Note, this does not need to be an expensive calculator; a basic calculator with these functions will suffice!

We will use SPSS (Statistical Software for the Social Sciences) for most of the data analysis. You may choose to purchase this software or use one of the campus labs. However, many former students found it highly beneficial to purchase the software to complete course requirements.

Purpose/Rationale

The course is designed to build on introductory courses in descriptive behavioral science statistics for graduate students. The focus of the course will be the application of statistical procedures within the research context and by the end of class students should be able to explain key concepts and techniques used in inferential statistics and how to apply these to answer scientific research questions. Specifically, the theory of hypothesis testing, how it relates to inferential statistical techniques (t-tests, ANOVA, Chi-Square, Multiple Regression) and how these testing methods can be used to solve real world questions.

Outcomes/Objectives

The course objectives for the students (per course catalogue) are:

- (1) Demonstrate a basic understanding of the theory of inferential statistics
- (2) Utilize the symbols and notations of inferential statistics
- (3) State appropriate hypothesis for given situations
- (4) Apply inferential statistics to behavioral science problems by...
 - a. selecting appropriate inferential techniques based on the nature of the variables being measured and the hypothesis being tested.
 - b. discussing assumptions of particular statistical models and examining results of applying different statistical procedures.
 - c. computing selected statistics from given data whether by hand or by using a computer package.
 - d. interpreting data and reporting results.
 - e. evaluating the practical significance of research results as they relate to our culturally diverse society.
- (5) Interpret computer printouts based on statistical knowledge.

Requirements:

A total of 100 points may be earned through the Data Analysis Project (40 points), Test (30 points), Homework (20 points), and Class Participation (10 points). Each assessment is described in more detail below.

1) Data Analysis Project (40 points):

You will write a formal research paper to demonstrate your skills and understanding of basic statistical topics covered in this course. You may use data provided in class or your own data, which should be pre-approved (by me). Specific directions and criteria will be handed out in class.

2) Test (30 points)

Each student will take an in-class Test designed to measure understanding of the material covered thus far in class

3) Homework (20 points)

There will be 10 weekly homework sheets. Each homework assignment is worth 2 points. Full credits (2 points) will be assigned only for completed work

4 Class Participation (10 points):

An approximate scale is:

- 0 points for excessive tardiness and/or essential lack of participation (including not completing assignments) and/or ill behavior (including chewing gum, eating loudly, yawning loudly, sleeping, complaining about grades, disruptive behavior, etc.) in class.
 - Being disrespectful and/or rude to the class will result in lowering your “Class Participation” grade.
 - Cell phones and pagers ringing during class are disrespectful and disruptive, and will result in lowering your “Class Participation” grade.
- 10 points for perfect attendance, consistent timeliness and responsibility, and consistent positive and constructive behavior in class.
 - A “Class Participation” grade of 10 points will be reserved for students who meet achieve 10 points and who stand out as strongly engaged in classroom activities (e.g., completing assignments; volunteering; frequent constructive verbal contributions; strong engagement in group activities, etc.)
 - 3 /10 “Class Participation” grade consists of Introduce yourself (1 point)/Pre Assessment(1 point)/Reflection on the Reading(1point)

General Course Expectations

Grading Policy

- A = All required work is complete and on time. Quality is above what is required. Student has demonstrated an integrated understanding of the subject matter and gone beyond basic requirements.
- B = All required work is complete; quality shows a basic understanding of material and writing has few mechanical errors.
- C = All work is complete; quality is lacking.
- D- (62 percentage points) = Work is incomplete (or has missing part(s)); quality is lacking.

The following scale will be used in this course

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

I have high expectations for every one of you, and I do not believe in grade “creep”, e.g., I believe that you should be graded fairly and on how you demonstrate **your knowledge**. I have unfortunately found it necessary to occasionally fail students.

I expect that most of you will earn an A or B in this class. However, this class is totally different from any other required graduate classes at EMU, many of you will struggle with this class and it is easy to get a low grade in this class. I have had many students complain that they were a 4.0 student before this class and are struggling in this class. Thus, if you have any questions or concerns, please contact me earlier in this semester.

Late Work Policy

Late work will **NOT be accepted**. An assignment is late if it is not turned in at the very beginning of the class it is due. I firmly believe that deadlines are a part of life and that allowing repeated revisions after a deadline has passed is a disservice and does not properly prepare a student for the future. Therefore, I do almost **anything** to help you **before** you are required to take a test or submit a project for which I have concrete deadlines. I will provide examples of my previous students work (usually only the best examples) so you understand what I expect of you. I require you to submit a draft well (minimum of 7 days) before the final submission is due and I will strive to give extensive and timely comments and feedback for their improvement. However, after all of the chances I give you, once a deadline passes and I assign a grade -- the grades are final.

Academic Honesty

University rules concerning plagiarism will be followed. You are expected to complete your own work and give appropriate credit when referencing work from other people.

Attendance Policy

- It is important for you to be in class both to learn and to help others learn. Arriving late and/or leaving early interrupts the flow of the class and is unprofessional.
- It is important that **you sign in every class session** as this will be my attendance role. I will set out a sign in sheet before class begins. If you come in after I start class it is **your responsibility to sign in** immediately after class (or during a break without disturbing the lesson) so you are not marked absent for the class.
- If you miss class, it is your responsibility to determine what you missed during class and submit the appropriate work timely. I consider it unprofessional to expect me to review class material that you missed with you, please do not ask.
- Absences **will lower your grade** in the class. **Each absence beyond one will lower your final grade by five percentage points.** Each time you are late or leave earlier I will count as $\frac{1}{2}$ an absence. I consider that leaving early can be more disruptive than arriving late. Thus, if you are planning to leave early, you must notify me in advance. Otherwise, your leaving early will be counted as **one absence**.

Professional Writing

Papers and tests should have few, if any, grammatical, spelling, or other mechanical errors. If you are not a strong writer, be sure to use the spelling and grammar checks on your computer, or a proofreader. There are NO excuses for not using these aids. Assignments with many errors will receive a grade of C or lower since this is unacceptable writing for teachers. Note: I will not correct all of your grammar/spelling errors—at most I will point out errors through one or more examples in your paper. It is **your responsibility to read and correct** the entire paper prior to submittal.

APA Formatting

- Papers should be typed, double-spaced, 12-point font, Times New Roman, 1" margins, and have no spaces between sections.

- Your paper must start with a numbered cover page that includes (in order) Project/study title, Course number & title, Your name, Your Program, Eastern Michigan University, Date of submission, and the semester (Fall 2007).
- All pages should have a page number with your last name on the top right corner.
- Papers **not followed the APA Style** will receive a grade **no higher than B**.

Course Incompletes

Incompletes will be given only: a) in extenuating circumstances; and b) after a student-initiated discussion with the instructor **prior to** the end of the semester. Generally, a student must have completed the majority of course work and have an average grade of "B" or better in order to be even considered for an incomplete.

- In this course, you must have **83% (B) or better** on the test 1 to qualify for an "I" grade.
- You must also present an acceptable reason (and accompanying documentation) for an extension, the date when your paper will be submitted, and your student ID number.

The instructor will provide the student and the department head with a rationale for the "I" grade and will specify the work required to remove the incomplete. An "I" grade must be removed within 12 months from the end of the semester or session in which it was issued or within 18 months from the beginning of the semester of registration for correspondence courses. These limits may be extended only under unusual circumstances upon the written recommendation of the instructor and with the approval of the dean of graduate studies and research. The initiative for conversion of an "I" to a letter grade rests with the student. If not converted, the "I" becomes a permanent part of the student's academic record. Permanent "I" grades may be removed only by repeating the course under the policy on repeating courses

Students with Disabilities

Pursuant to the Americans with Disabilities Act (ADA) of 1990, students with qualified disabilities will not be the objects of illegal discrimination in this class. If you have a documented disability, please contact me immediately so that I can provide appropriate accommodations to the learning environment.

Course Calendar

(Subject to change if needed)

		Topic	Reading	Assignment Due
<u>Week 0</u>	Jan. 7	To be ready for the class	<i>Learning From Each Other</i> (Kim, 2005) Chapters 4-5*	<i>Introduce Yourself (CP1)/ Pr-assessment (CP2)/ Reflection on the Reading(CP3)</i>
<u>Week 1</u>	Jan. 14	Review of measures of Central Tendency, Variability, Correlation, & Linear Regression Theory of Hypothesis Testing	<i>Chapters 7-9 Units I-V & VIII**</i>	<i>Review of Central Tendencies(H1)</i>
<u>Week 2</u>	Jan. 21	<i>Martin Luther King Jr. Day -No Class</i>		
<u>Week 3</u>	Jan. 28	Sampling distributions	Chapter 10 <i>Units I-V, VIII</i>	<i>Correlation/Regression Homework(H2)</i>
<u>Week 4</u>	Feb. 4	Hypothesis Testing and Estimation	Chapters 11/12 <i>Units I-V, VIII</i>	<i>Sampling Homework(H3)</i>
<u>Week 5</u>	Feb. 11	Hypothesis Testing (σ unknown)	Chapter 13 <i>Units I-V, VIII</i>	<i>Hypothesis Testing/Estimation Homework(H4)</i>
<u>Week 6</u>	Feb. 18	Mean comparisons with independent and dependent samples Statistical Power	Chapters 14/15 Unit VI Chapter 17	<i>Hypothesis Testing 2 Homework(H5)</i>
<u>Week 7</u>	Feb. 25	<i>Winter Break-No Class</i>		
<u>Week 8</u>	Mar. 3	One-Way ANOVA	Chapter 18 Unit VII	<i>Statistical Power Homework(H6)</i>
<u>Week 9</u>	March 10	Two-Way ANOVA	Chapter 19 Unit VII	<i>One-Way ANOVA Homework(H7)</i>
<u>Week 10</u>	March 17	<i>Test</i>	<i>Test</i>	<i>Test</i>
<u>Week 11</u>	March 24	Manova	Chapter 20 Unit X	<i>Two-Way ANOVA Homework(H8)</i>
<u>Week 12</u>	March 31	Multiple Regression	Electronic Reserves	<i>Chi-Square Homework(H9)</i>
<u>Week 13</u>	April 7	DAP Practice		<i>Multiple Regression homework(H10)</i>
<u>Week 14</u>	April 14	DAP Practice		<i>DAP Draft</i>
<u>Week 15</u>	April 21	DAP Presentations		<i>DAP DUE</i>

* Chapter denotes reading from Minium, E.W., Clarke, R.C., & Coladarci, T. (1999). *Elements of statistical reasoning*. New York, NY: John Wiley & Sons, Inc.

** Unit or Lesson refers to Green, S.B. & Salkind, N.J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data*, 4th ed. Upper Saddle River, NJ: Pearson Education, Inc.

CP1=Class Participation grade 1; CP2= Class Participation grade 2; and CP3= Class Participation grade 3.

H1=Homework grade 1; H2=Homework grade 2, etc.