Psychology 302 – Statistical Methods in Psychology

Winter 2012
Lecture: Mondays and Wednesdays 2:00-3:20 pm in Straub Hall 142
Labs are held in 180 Straub Hall at the designated times (see "lab instructors" section)

Instructor: **Laura Kaehler, M.S.**

Email: lkaehler@uoregon.edu
Office: Straub 383
Office Hours: Mondays 1:00-2:00;
Wednesdays 1:00-2:00

Lab Instructors:

Job Chen	**Kathryn Iurino**
Thursday: 8:30-9:50am	**Friday: 2:00-3:20pm**
Friday: 8:30-9:50am	**Friday: 4:00-5:20pm**
Email: zhuochen@uoregon.edu	Email: kiurino@uoregon.edu
Office: Straub 202	Office: Straub 353
Office Hours: Thursdays 11:20-1:20	Office Hours: Fridays 10am-Noon

Straub Computer Lab rooms are open **Monday through Friday (times are posted on lab doors). SPSS IS ALSO AVAILABLE ON THE KNIGHT LIBRARY COMPUTERS.**

OVERVIEW OF COURSE STRUCTURE

Course Objectives: At the end of this course you will be able to read a description of a research study and then identify the appropriate statistical technique needed to answer the research question. Using hypothesis testing procedures, you will also be able to conduct this test (both by hand and using statistical computing software) and draw a conclusion (written in APA style) based on your analyses.

Course Description: This course will introduce you to descriptive and inferential statistics, teach you how to calculate statistics and analyze data using a computer statistics package, and improve your ability to understand and evaluate the statistical information reported in primary research articles.

This class both is and is not really a math class. Although you will be learning how to do statistical calculations by hand, this course is very different from courses taught in mathematics departments. The focus in this class is on conceptual understanding of statistics. In the past, most students have found that the actual "number crunching" in this class is relatively easy. It is the conceptual understanding of statistical methods that is more difficult. Once you understand the concepts, you will probably have little trouble doing calculations.

Course Design: The course promotes active learning — through discussion, solving problems, and computer exercises. The instructors and TA are guides, cheerleaders, and coaches. The course encourages teamwork among students, instructor, and TA. *Although quizzes are to be completed individually, students are encouraged to work together on homework.*

Responsibilities: If you complete this course, you will earn 4 credits toward your degree. According to University principles governing credit and contact hours, each credit is equivalent to 30 hours of work. Your 4 credits for this course are equivalent to 120 hours of work over 10 weeks, which is 12 hours per week. You will spend about 4 hours in class and lab each week and should expect to spend up to 8 hours engaged in reading, studying, and/or completing homework assignments outside of class each week.

COURSE REQUIREMENTS

1. Attendance. Participation points are gained from in-class exercises on random lecture days. Credit is based not at all on whether you got the right answer, but only on whether you tried. If you miss a participation day, you may post **2** news articles that include statistics on the discussion board. You must include a brief write-up about each article focusing on the statistics in the article and how it relates to material covered in the course. The articles must be recent (within the past week) and the discussion board post must be made within 2 days of the absence. This can be used to make up only 1 missed participation day.

Class attendance in both lecture and lab is strongly encouraged. In fact, the correlation between class attendance and final grade has been shown to be r = .479, meaning approximately 23% of the variability in total points earned in the class was related to class attendance. While correlation is not causation, this is something to consider nonetheless. If the previous 2 sentences didn't make sense to you, fear not, they will by the end of the course. ☺

2. Homework. Homework assignments are due **Tuesday evenings at 6pm, electronically.** Homework has two components:

- Aplia software questions. These become unavailable when due, so **cannot be turned in late**.
  - o Make sure to register with Aplia using the same name that you use on Blackboard for grading
  - o You will get three attempts at the right answer. Your score will be the average of all attempts.
- The SPSS portion of the homework should be completed as a Word document (.doc). Make sure to include any relevant SPSS output in your file. To turn it in, go to the course Blackboard page, 'Assignments.' This will lead to a page where you can upload your document.
  - o For help, http://library.uoregon.edu/scis/blackboard/faq/students/s9.html or ask lab instructor
  - o 10% reduction in points available for every day late (for SPSS portion only – no late Aplia).

3. Quizzes. You will have 40 minutes to complete each quiz (half of a lecture period). Be on time!! Quizzes will cover all material since the previous quiz and will be conceptual rather than calculation based. Quizzes will be completed on a scantron form. On quiz days, we will have a half lecture for 40 minutes following the quiz. You may sit quietly or leave and return if you finish a quiz early but you may not leave the room until I have your quiz. At the end of the term, you will have the option of taking a "make-up" quiz, which will replace the lowest of your 5 quiz scores. Therefore, if you miss a quiz (and have a score of 0 for that quiz), the makeup quiz can be used to replace that. This is the only option for making up missed quizzes – no exceptions! On the final day of lecture, you will have half the period to complete Quiz 5 and the remaining time to complete the makeup quiz (if you are taking it).

4. Final Exam. The final exam will be cumulative. A major component of the final will be selecting the appropriate statistical test to answer a given research question. Knowing when to use which statistical test (i.e., how to appropriately analyze your data) is one of the fundamental goals of this course.

5. Books, Aplia, & Calculator. The required text is Gravetter & Wallnau, *Essentials of Statistics for the Behavioral Sciences*, 7th edition. Read assigned chapters **before** class and do Learning Checks as you encounter them. **Reread** if you encounter trouble on a Learning Check. The second time, you will understand more. Aplia is the online program you will use to complete your HW assignments (except for SPSS/PASW problems). You MUST purchase this. An e-

book of the textbook is included with Aplia so you are not required to purchase a hard copy of the text. You will also need a hand-held **calculator** that can do single variable statistics. No need for graphing calculators. **Bring calculator & text to class.**

SPECIAL NEEDS

Students with Disabilities: If you have a documented disability and may need accommodations, contact us ASAP. Please let us know in advance even if you are not sure that your disability will require accommodation (for example, if you have a physical disability that may require you to miss class, but you aren't sure it will). Students who are experiencing learning difficulties are encouraged to consult Disabilities Services (164 Oregon Hall; 346-1155; http://ds.uoregon.edu/). Without documentation, accommodations are made at the discretion of the instructor. **Other Students**: If you are repeating this class, or have other circumstances that might affect your ability to devote time to the class, please let us know now so we can discuss strategies to promote your success in this course. If you wait until you have problems in the course it may be too late to salvage your grade, but planning ahead will likely lead to success.

COLLABORATION

Collaborative Learning:
Discussing homework with other students and your instructors is encouraged, as are homework and study groups for quizzes and exams. Talking over the problems and reworking them when you discover that others got different answers promotes deeper understanding of concepts. However, each student must submit a separate homework which was *written independently* (no photocopies or word-for-word copying), and you must show your work for all by hand calculations. More explicitly, you may work together to solve problems and check your answers on homeworks with each other, but preparing those answers for your homework and the actual writing of **any** verbal answers need to be done independently.

Individual Work (when Collaboration = Cheating)*:*
Your work on the **Quizzes and Final** must be your own. Copying the work of others on these elements is cheating, and will earn you an F for the course. (The University may impose additional penalties in accordance with the student conduct code.) Quizzes are a reflection of individual work--rely on your own knowledge only.

THREE WAYS TO DO WELL

1. **Keep up and keep trying**. Read assigned chapters early and often, come to lecture and lab, start on homework immediately so you will finish early enough to compare notes with others. If you keep up and keep trying, the concepts will eventually sink in. Turn your homework in on time. Slog through those chapters even if you only understand half of what you read. The fog will clear if you just persist. Don't give up!
2. **Work hard on understanding early material.** If you have a pretty good feel for the concepts in the first half, the second half will deepen your understanding and so what you are learning will make sense rather than being a maze of confusing techniques. If you don't grasp the concepts in the first half, the second half will not make much sense to you. Seek help *early* when you are feeling bewildered or lost.
3. **Stay in touch and speak up.** All of your instructors want you to do well! Ask us questions in class. Forming a clear question helps you discover what you do and do not understand, which is vital to mastering this subject.

TOP FIVE PITFALLS

1. Concluding that struggling in this course means you just can't get statistics. This course draws upon several different types of skills – math skills as well as conceptual understanding skills. It is unusual for any

given student to sail through without struggling with at least some element of the course. Failing is only an indicator that you need to put forth more effort – not that you aren't smart enough to do it! We will do our best to teach in a way that meets your individual needs, but we don't know what those needs are until you tell us. Please speak up when you don't understand something!

2. **Passive listening and reading.** Write, draw, figure. Think with a pencil to learn. Turn the concepts into something you do. To succeed, you must be able to explain and execute.

3. **Beginner's luck.** Doing it right once doesn't mean you can repeat the trick. Get it wrong to understand how the process works. Mistakes help you learn.

4. **Trying to cram.** You can cram content, but skills don't compress. Don't fall behind; it's too hard to catch up.

5. **Giving up because you get stuck.** Everyone gets stuck. Math is all about getting stuck and unstuck. When this happens, play around. Try a new tactic. ***Ask for help.***

6. **Spectator overconfidence.** Watching someone go through the steps is a starting point only. You have to get in the pool to learn how to swim.

GRADING

Your *final course grade* is based on the following components:

36% Score on the 9 homework assignments
40% Score on 5 quizzes/exams
19% Cumulative final
5%   Attendance

Final grades will be based on percentage of total possible points earned, distributed as follows:

	Percent		Percent		Percent		Percent	If taking Pass/Fail
A	93-100	B	83-86.9	C	73-76.9	D	63-66.9	P	70+
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9	N	< 70
B+	87-89.9	C+	77-79.9	D+	67-69.9				

COURSE SCHEDULE
Schedule, homework due dates and quiz dates subject to change

Date	Topic	Readings	Quizzes/Assignments
1/7	Course Introduction, Some Key Terms		
1/9	Scaling, Histograms, Frequency Tables	Ch. 1-2	
1/10; 1/11	Lab 1		
1/14	Central Tendency and Variability	Ch. 3-4	HW 1 due 1/15 by 6:00pm
1/16	Z-Scores and the Normal Distribution	Ch. 5	
1/17; 1/18	Lab 2		
1/21	MLK Jr. Day-NO CLASS!		HW 2 due 1/22 by 6:00pm
1/23	Probability and the Normal Distribution	Ch. 6	**Quiz 1**
1/24; 1/25	Lab 3		
1/28	Distribution of Sample Means	Ch. 7	HW 3 due 1/29 by 6:00pm
1/30	Hypothesis Testing with z	Ch. 8	
1/31; 2/1	Lab 4		
2/4	The one-sample t-test	Ch. 9	**Quiz 2;** HW 4 due 2/5 by 6:00pm
2/6	Independent samples t-test	Ch. 10	
2/7; 2/8	Lab 5		
2/11	Related samples t-test	Ch. 11	HW 5 due 2/12 by 6:00pm
2/13	Intro to ANOVA	Ch. 13	**Quiz 3**
2/14; 2/15	Lab 6		
2/18	One-way ANOVA		HW 6 due 2/19 by 6:00pm
2/20	Factorial ANOVA	Ch. 14 (428-456)	
2/21; 2/22	Lab 7		
2/25	Repeated ANOVA, ANOVA Review	Ch. 14 (414-428)	HW 7 due 2/26 by 6:00pm
2/27	Correlation	Ch. 15 (466-498)	**Quiz 4**
2/28; 3/1	Lab 8		
3/4	Regression	Ch. 15 (498-517)	HW 8 due 3/5 by 6:00pm
3/6	Chi-Square	Ch. 16	
3/7; 3/8	Lab 9		
3/11	Which Test? Review and Recap	Pages 614-623	HW 9 due 3/12 by 6:00pm
3/13	**Quiz 5; Makeup Quiz**		
3/14; 3/15	No Lab		
3/19 (3:15 pm)	**Final Exam**	**Cumulative**	