

Psychology 3101: Research Methods and Data Analysis in Psychology

Spring 2012

Introductions

Prof. Matthew Keller
Muenzinger, 3rd floor Room D347B
303-735-5376
matthew.c.keller@gmail.com
Office Hours: Monday & Wed 11-12

TA's

Dan Howrigan
Muenzinger E347A
Office hours: Mon. noon-2pm
Keith Lohse
Muenzinger E235
Office hours: Thurs. 10am-noon
Andrew Reineberg
Muenzinger D0040D
Office hours: Tue 2-4pm
Matthew Simonson
Muenzinger E347A
Office hours: **Fri 8am-10am (change from syllabus!)**

Weekly Schedule

- M/W/F Lectures
- Weekly mandatory labs
 - turn in last week's HW
 - short quiz (over material since last lab)
 - go over answers
 - questions about material
 - begin HW (work in groups)
- Office hours
- Facebook (CUStatistics)
 - for questions & discussion

Goals of course

- To give you a conceptual understanding of statistics used in behavioral research.
- To educate you to be an informed citizen who can critically evaluate statistical arguments that are presented in scientific journals and books or in the news.
- To prepare you to take more advanced statistics courses offered at CU or in graduate school.
- To provide an introduction to computerized data analysis and interpretation.

Why I love teaching stats

- Statistics is critical to being a person educated in the science of psychology
- It's empowering
- It's challenging
- It's fun

Course Evaluation

Lab grade (40%): Equal weighting of homeworks and quizzes

Three midterms exams (10% each)

Feb 17, Mar 23, Apr 27

Cumulative final exam (30%)

Tue, May 8, 4:30-7:30pm, Muen E0046

Exams & quizzes closed book; must know formulas for material in exams 1 & 2.

Exam Policies

Grading

E.g., if average of top two grades is 95%, then an A is $95 \cdot 90 = 86$, a B is $95 \cdot 80 = 76$, etc.

Missed exams

Documented disabilities

Course wiki

<http://psych.colorado.edu/wiki/>

Then click on the link for 3101-Keller

Syllabus, Lectures, Readings, Labs (homework, etc.).

Readings

Gravetter, F. J. & Wallnau, L. B. (2009). Fundamental statistics for the behavioral sciences (4th edition).

Throughout the course, I will also assign interactive readings from the website, Seeing statistics: <http://www.seeingstatistics.com/>

Statistical Software

R (free and available for both PC and Mac)

Basic algebra skills pretest

Complete the following problems. You may NOT use a calculator. You may report answers as fractions unless otherwise specified.

1. $4234 - 48290 =$

2. $370 \div 8 =$

3. $7^*8 \div 91 =$

4. $|-57| =$

5. $(-5)(-12) =$

6. $26 - (-6) =$

7. $12^2 =$

8. $\sqrt[3]{16} =$

9. $4^{5-3} =$

10. $3 + 4 \cdot 2 =$

11. $5(4 - 1) =$

12. $3^*4^2 =$

13. Convert 38% to a reduced fraction

14. Convert $1/25$ to a percentage

15. What is 12% of 250?

16. What is $4x^3 - 12$ if $x = -2$?

17. What is $2xy - y + 5x$ if $x = 3$ and $y = -4$?

18. Rearrange to write x as a function of y :

$$y = \frac{4}{7-x}$$

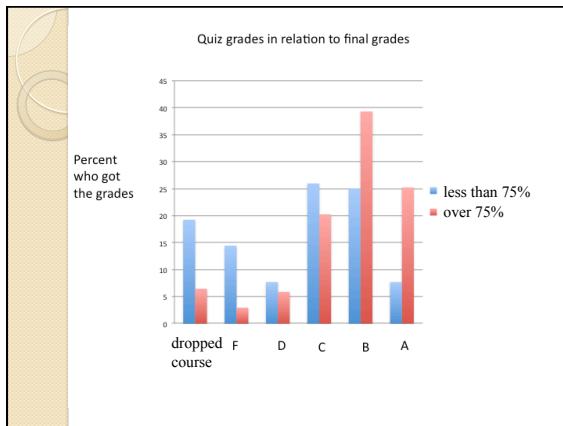
19. Solve for z : $76 = 12z + 6$

20. Solve for x : $x^2 - 5 = 12$

21. Solve for x and y :

$$y = x - 5$$

$$x + y = 2$$



Course Content

Research design

Hypotheses, experiments, non-experimental studies, etc

Descriptive statistics

Describing distributions of data

Measures of central tendency and variability

Probability

Inferential statistics

Sampling distributions of statistics

Hypothesis testing, statistical power, type I and II errors

Inferential tests of means:

Single sample t tests

Independent samples t tests

Paired or dependent samples tests

Analysis of Variance – one way, repeated measures, & factorial

Regression – simple, multiple, discrete predictors

False discoveries in science

Keys to success

1. Realize that learning statistics is up to you.
2. Do assigned reading before class.
3. Supplement textbook reading with *Seeing Statistics* website.
4. Do all homework assignments.
5. Attend class and labs, and pay attention.
6. Take notes intelligently.
7. Don't fall behind.
8. Make some friends in your lab.
9. Ask questions in lecture, lab, and office hours.
10. Embrace the challenge and try to have fun.