Background and Purpose of Course
The course considers the role of measurement and data analysis focused on psychology. To understand data, you need to understand its distribution, and the implications of its distribution on any questions you want to ask. To test an idea using data, you have to select wisely. The tests also make some assumptions about the distribution of the data and what is appropriate to do. Thus, various forms of measurement and standards for the evaluation of measures are explored in this course. You will learn how to summarize, organize, and evaluate data using a variety of techniques that are applicable to research in psychology. Among the analyses are tests of means, various forms of analysis of variance, correlation and regression, planned and post-hoc comparisons, as well as various non-parametric tests. Research design is also explored.

Why learn statistics, other than to fulfill a requirement?
Here are good reasons for doing so.
1) Understanding statistics is crucial to being able to read psychology research articles.
2) Understanding statistics is crucial to doing research yourself.
3) Understanding statistics helps to develop your analytic and critical thinking.

Of course, experimental design issues are vastly important to understanding which statistical test to use. Thus, we will start the course reviewing these concepts, including simple ideas such as independent and dependent variables, and more complex ideas such as random selection, matched group designs, repeated measures designs, and so forth. It is important to have a common terminology to discuss the story problems you will use for practicing stats tests, and to select the appropriate statistical tests to conduct in exams, homeworks, and in your future experimentation.

Statistical Packages Used
Excel, and Excel with StatPlus
SPSS any version you can access (19-24)
Some R studio use.

We will also calculate a lot of stuff by hand. Calculators are essential, but nothing fancy. You need to square stuff, and find the square root, and do normal algebraic functions.

**Flexibility in Using Formulas, Stats Packages, Calculators, Software for Math**

I am sometimes asked by students if they can use a different mathematical package because it is something they are used to. I think it is important to be flexible in doing calculations and using software – you don’t want to absolutely need any particular package to get something done. However, it will be important to you in psychology (in psychology classes, in reading articles, in comp, etc.) to be able to use SPSS as a statistical package, so I will ask you to use it consistently in your homework. If you also want to run the stats on another package, that’s fine, but I need to see you demonstrate competence on SPSS. So don’t fight the need for that.

My teaching focuses on definitional formulas for you to use to calculate statistics. These types of formulas emphasize the meaning of the statistics you are doing, and they remind you of how you are manipulating data or what you are constructing as you use them. Definitional formulas are typically not the easiest formulas to put into a calculator, to mathematica, etc. though. There are formulas called computational formulas, which were invented mostly about 40 years ago when people used calculators pretty exclusively to run statistics. They are mathematical shortcuts to getting an answer, but conceptually they are empty.

**Assignments**

There will be weekly homework assignments, a midterm exam and a final exam. In addition, there is one short paper assignment, in which you design an experiment with the express purpose of picking appropriate statistical analyses to use with the data you would collect. Each exam covers only the material just before it, so there will be no cumulative exam over the entire term.

**Grading**

Course Grade (Psy 200):

- **Two exams**: each worth 30% of your lecture grade. (Wed Feb 1 and Wed March 8)
- **Paper**, including preliminary construction, on experimental design and stats analysis: 30% of your lecture grade. (due Wed March 15, by noon)
- **Participation** makes up an additional 10% of your lecture grade.

Laboratory Grade (Psy 201):

- **Homeworks**: approximately 9 assignments, worth 10% each, make up your lab grade.
- **Participation** also makes up 10% of that grade.

**Penalties**

The course and lab go rather quickly, and it is important to stay current with homeworks. The grading of the homeworks is also a very onerous task, especially if I want to give you feedback about what you are dong wrong, or how you are doing generally. Thus, I need you to hand in homeworks on time. The homeworks will be penalized for lateness, and after 2 weeks of the deadline for each, they will no longer be accepted.

**Academic Honesty**

I don’t want to prohibit you from working in groups to work out the homework problems. Working in groups can be a good learning experience, and can make the work fun. However, you should not copy someone else’s homework, or their answers. To assure me that you are not doing that, I will be asking you to show your work on various homework problems. This means that you need to write down all steps that brought you to the answer. Having the correct answer, but no steps to show me how you got there will lead to LESS POINTS for the answer than showing both.