**SYLLABUS**

**PSYCHOLOGY 340 SECTION 001**

**STATISTICS FOR THE SOCIAL SCIENCES**

**Illinois State University**

**Adena B. Meyers**

**Fall 2013**

**Contact Information**

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**General Course Information**

**Course Overview**

This course is designed to cover hypothesis testing in the behavioral sciences, building on concepts learned in PSY 138. The logic, assumptions, computation, and interpretation of inferential statistics will be covered, including one-sample, related-samples, and independent-samples t-tests; one-way and two-way ANOVA; correlation and bivariate and multiple regression; and non-parametric procedures. In addition to the logic of hypothesis testing, PSY 340 will integrate the use of the software packages SPSS and Microsoft Excel as tools for data management and hypothesis testing. Writing skills will also be developed through a research report and written questions on exams, homework, and in-class assignments.

**Course Objectives**

As a result of taking PSY 340 students will have the opportunity to apply important quantitative reasoning skills as they relate to research in the behavioral sciences. Specifically, the course will help students develop the following skills and abilities:

1. Think critically about the use of hypothesis testing in the behavioral sciences.
2. Choose an appropriate statistical test for specific forms of data and hypotheses.
3. Understand the logic and mathematical basis for different inferential statistics.
4. Use computers and the software package SPSS as a tool for data management and hypothesis testing.
5. Draw valid conclusions about hypotheses from the results of different statistical tests.
6. Coherently describe conclusions from a hypothesis test in written form.

**Required Textbook**

**Gravetter, F.J. & Wallnau, L.B. (2013). Statistics for the behavioral sciences, 9th Edition.**

This textbook is **REQUIRED.** You will need your own copy in order to keep up with the class content and assignments. Chapters supporting the lectures are assigned for you to read each week and most of the homework assignments come from the problems at the end of each chapter. Thus it is essential that you own (or rent) a copy of the textbook in order to complete the assigned homework.

**Evaluating Student Performance**

**Homework --- 30%**

The homework is essential to understanding concepts and practicing skills. Assignments are designed to assess students' knowledge of the specific statistical tests, the application of those tests to specific types of data, and the computation of those tests using SPSS and/or Excel. All homework is to be turned in no later than the beginning of class on the due-date. Late work that does not comply with the above policies will still be graded, must still be turned in, but will receive no more than 50% of the possible points. In all cases, written documentation may be requested. Homework must legible, and if handwritten, must be completed in pencil. When applicable, the final answer must be clearly marked. All pages should be stapled together, with the student’s name on the front page. At the grader’s discretion, points may be deducted for homework that does not conform to these guidelines.

**Class Participation and Preparedness --- 20%**

My teaching style is one that depends upon student attendance and active participation. Although there will be content presented in the form of power point lecture during each class, sitting passively through these lectures will not cause you to learn statistics. Therefore, there will be numerous in-class exercises and hands-on activities designed to increase your understanding of statistical concepts and your ability to apply the concepts to social science research problems. I expect you to engage in these activities as collaborative learners with your classmates. Even if you understand a concept because you remember it from 138 or from reading it the night before in the textbook, your presence and participation will give you a chance to reinforce your own understanding and to help others in the class. If you miss a class, you will miss out not only on important material, but also on opportunities to engage in an active and collaborative learning process with your classmates.

It is essential that you come to class prepared, having read carefully the assigned textbook sections and completed any homework assignments.

You have signed up for a statistics class that meets at 12:35 on Tuesday and Thursday afternoons. It is your responsibility to plan your schedule to ensure that you are present, prepared, nourished, and alert during class.

Class participation and preparedness will be assessed through performance on in-class learning activities throughout the semester. If you miss a class in which a learning activity has occurred, you will generally not have an opportunity to make-up the missed work. In exceptional circumstances, make-ups may be given at the discretion of the instructor. Make-ups will only be allowed for excused absences, and will be limited in number (i.e., no more than two activities can be made up; after two have been made up, the student will receive zeros on missed activities).

**Exams --- 35%**

Four in-class exams and one final exam will test students' conceptual and mathematical understanding of course material. Exam questions will be short answer in nature, and although exams will emphasize material covered most recently, **each and every exam is implicitly and explicitly cumulative!** Exams will cover all material covered in lecture and in the textbook. Similar to the homework assignments and in-class exercises, make-up exams will be administered only in grave circumstances (e.g., medically unable by doctors written orders, death in the immediate family) or with prior approval of the instructor. You must also contact the instructor as early as it is feasible to arrange an absence from an exam and obtain a make-up exam. If you have a valid reason why you cannot take the exam but wait until after the exam, you may not be given a make-up exam if it would have been reasonably possible to contact the instructor earlier. This policy does not mean that you have to have an ambulance pull over to call the instructor if you have a car accident on your way to an exam. You should, however, contact the instructor as soon as it is feasible to do so. Voice-mail and email make doing so very convenient.

**Data Analysis Project** **--- 15%**

Each student will complete a data analysis project during the semester. You will be given a data set and a list of questions to answer. To complete the project, you must choose appropriate statistical tests to answer the questions, run the appropriate test(s) using SPSS (and/or Excel), interpret the output, and write a paper (roughly five pages) describing the problem and the conclusions from the statistical test results. This project will test students' ability to apply and conduct an inferential statistic to a specific problem of interest. The research report will be written in APA style and laser-printed (or printed with an inkjet printer of similar quality). Blurred printing, smudged printing, or less-than-laser quality printing is unacceptable and will result in a grade of 0. The projects are due on the last day of class (December 5); late projects will not be accepted and will be assigned a grade of zero. Additionally, failing to run a spell-check on the assignment will result in losing 10% for each spelling error that would have been caught by a standard spell-checking program.

**Grading Scale**

A weighted grade score will be calculated for each student in which the simple average of all assignments within each category are weighted according to the percentages above and added together:

Score = 0.30\*(homework average) + 0.20\*(in-class activities average) + 0.35\*(exam average) + 0.15\*(project)

Grades will be assigned based on the following ranges:

Grade Percentage Score Range

A 90 - 100

B 80 - 89.9

C 70 - 79.9

D 60 - 69.9

F 0 - 59.9

**Extra-Credit opportunities for Psych 340**

Additionally, students may gain an additional 2% of extra credit through participation as research participants. For each hour of participation a student will get 0.5 percentage points of extra credit (so to get the maximum amount of extra credit, students must participate in 4 hours of experiments). Instructions regarding research participation sign-up will be provided in a separate handout.

Alternative methods of extra-credit can be done in the form of extra "journal summaries". This would involve finding a research article from a peer-reviewed journal (not something like Psychology Today). You should write a brief summary of each major section of the paper, including hypotheses, how they will be tested, what methods are used, what assumptions are being made, how the analysis was done, what the conclusions were, etc. Additionally, you must include a paragraph that expresses what YOU thought about the paper, what questions still remain in your mind, what you might have done differently, any alternative explanations, etc. Each of these summaries will count as much as one hour of experiment participation. These assignments must also be turned into the instructor no later than **the last day of lectures**.

So to get full extra credit you may complete one of the following three sets of assignments/activities:

* 4 hours of experiment participation
* 4 extra journal summaries
* Some combination of these options (e.g., 3 journal summaries and 1 hour of experiments).

**Academic Dishonesty**

You are expected to do your own work. Plagiarism and cheating of any sort will not be tolerated. Either behavior will result in a grade of "F". Making up false excuses for absences will also be considered cheating and may result in a grade of "F".

And finally, if you have any questions regarding anything in the syllabus or the course in general, please feel free to ask. Talk to me in class, via phone, or e-mail. Don't just assume that you know (or should know) the answer. I may not have been clear enough or may have forgotten to mention something.

**Accommodations**

Illinois State University is an institution and a faculty concerned with helping all of our students feel welcome, and with helping all students learn and develop to their full potential. Any student needing to arrange a reasonable accommodation for a documented disability should contact Disability Concerns at 350 Fell Hall, 438-5853 (voice), 438-8620 (TDD).

**How to Succeed in PSY 340: Advice from Dr. Meyers**

I know that statistics is a class that many students enter with apprehension (among other feelings). I assume that you are all capable of mastering the material in this class, and I will do my best to help you succeed in doing so. However, learning statistics requires your active participation in the process. I am your teacher, but **I can’t learn the material for you**! If at any point in the semester you find that you are struggling with this class, please come and talk to me (the sooner the better). Meanwhile, here are some things you should plan on doing in order to increase your chances of success:

1. **Don’t be avoidant**! If you find statistics aversive (especially if you are easily bored, or if you are uncomfortable with math or symbolic expressions), you may be tempted to avoid it (by procrastinating on out of class reading and homework assignments, missing class, or simply tuning out during class). Don’t let this happen – it is a slippery slope! The more you avoid it, the more aversive it will become, and the more you will want to avoid it.

1a. **Complete all of the assigned readings**. This isn’t fun, but spending the time and effort will pay off in terms of your comprehension and performance. Since (let’s face it) the reading is not particularly entertaining, I recommend that you come up with ways to reinforce yourself for reading (for example, plan short breaks to do something fun or relaxing to reward yourself after you finish reading a section of the text).

1b. **Come to class**. A small number of you are probably capable of teaching yourselves statistics simply by reading the textbook and doing the homework. If you are one of these students, and you don’t want to come to class, you should choose a different section of 340. In my section, I expect students who are on top of the material to come to class and take part in the collaborative learning process. You will find that your own understanding of concepts and ability to apply the skills are strengthened when you explain the material to others (this is one of the reasons that I like to teach statistics – to keep my own knowledge of this material fresh). **It is virtually impossible to earn a grade higher than C if you do not come to class.** On the other hand, in-class activities are completed collaboratively, and will generally be graded more leniently than homework assignments and exams. Thus if you are struggling in this class, then **attending regularly and participating actively will directly help your grade**.

1c. **Complete all parts of all of the homework assignments**. If you do not complete all of the parts of all of the questions, you will lose points. If you miss homework assignments or turn them in late, you will lose points. Plan your schedule in a way that allows you to get all of your work done on time.

1d. **Answer questions in class**. I tend to use a Socratic style in my teaching. If you think you know the answer to a question (even if you may be wrong), give it a try. You will probably remember the correct answer better if you give an answer (even if you are wrong), and there is no penalty for guessing incorrectly.

1e. **No internet browsing, texting, or emailing during class!** When you come to class, don’t waste your time once you are here. I interpret this as avoidant behavior and will point it out if I see it happening.

2. **Self-monitor** **your own learning and understanding**. Much of the material presented in this class (especially in the first several weeks) will have a familiar ring to you. We will be reviewing concepts that were presented in 138, research methods, and mathematics classes. However, we will be moving into more complex material as well. The point at which the material becomes unfamiliar or challenging will be different for each student. Learn to recognize what you know and what you don’t so that you can pay more attention, ask questions, or go back over material that you don’t fully understand.

2a. **Check your understanding as you read**. If something doesn’t make sense to you, go back and re-read or make a note to ask about it in class.

2b. **Ask questions**. If something is unclear to you, you can bet that it is unclear to someone else in class too. If no one asks me about it, I won’t know that people are confused. I will usually start each class asking if anyone has questions, and I welcome questions throughout class as well. By asking questions, you are helping yourself and your classmates to be more successful students, and you are helping me to be a better teacher.

2c. **Take notes**. Although you can read along with the power point, you should not do this passively. Taking notes **during lecture**, **as you read**, and **as you study** for exams will help you self-monitor your own understanding.

2d. **Give yourself sufficient time** to complete readings and assignments. To do this, you will need to be able to estimate how long it will take you to read and understand the assigned portions of the textbook, or to complete the assigned homework problems.

3. **Buy (or rent) the textbook.** It is required. You will need to have it in order to prepare for lecture and to access homework problems. Once you have paid for it, use it! Read it and bring it with you to class.

4. **Remember that statistical knowledge and skills will benefit you**. Statistics courses are required of psychology majors because statistical methods are fundamental tools in social science research. If you do not understand statistics, you really cannot understand psychological science. Moreover, the skills you learn in statistics classes can be applied in contexts outside of psychology (such as business, public policy, and other social sciences). When you graduate with a bachelor’s degree in psychology, statistics may be one of your most marketable skills. And if you plan to attend graduate school in psychology, you will probably be required to take additional statistics courses that will build upon the material covered in your undergraduate classes.

**Psychology 340 Topics and Assignments**

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| **Class Dates** | | **Tentative topic Calendar** | **Read** | **HW** |
| WK1 | Aug 20 | Introduction and syllabus review. Review of SPSS and Excel. | Syllabus | HW1  Due 8/27 |
| Aug 22 | Review of definitions & frequency distributions | CH 1 & 2, Appendix D |
| WK2 | Aug 27 | Describing distributions: Center and Variability | CH 3 & 4 | HW2  Due 9/5 |
| Aug 29 | Z-Scores | CH 5 |
| WK3 | Sept 3 | Probability | CH 6 | HW3  Due 9/12 |
| Sept 5 | Distribution of Sample Means & The Central Limit Theorem | CH 7 |
| WK4 | Sept 10 | Hypothesis Testing, Effect Sizes, and Power | CH 8 |
| Sept 12 | Exam Review Day | CH 1-8 | Study for Exam I |
| WK5 | Sept 17 | **EXAM I (Focus on building blocks of inferential statistics)** | | |
| Sept 19 | One Sample t-tests | CH 9 | HW4  Due 9/24 |
| WK6 | Sept 24 | Independent Samples t-tests | CH 10 | HW5  Due 10/1 |
| Sept 26 | Related Samples / Repeated Measures t-tests | CH 11 |
| WK7 | Oct 1 | Estimation and confidence intervals with t-tests | CH 9-11 | HW6  **Due 10/3** |
| Oct 3 | Exam Review Day | CH 9-11 | Study for Exam II |
| WK8 | Oct 8 | **EXAM II (Focus on t-tests)** | | |
| Oct 10 | One-Way (Single Factor), Between Groups ANOVA | CH 12 | HW7  Due 10/15 |
| WK9 | Oct 15 | One-Way (Single Factor), Between Groups ANOVA, continued | CH 12 | HW8  Due 10/22 |
| Oct 17 | One-Way (Single Factor) Repeated Measures ANOVA | CH 13 |
| WK10 | Oct 22 | One-Way (Single Factor), Repeated Measures ANOVA, continued | CH 13 | HW9 Due 10/29 |
| Oct 24 | Factorial ANOVA | CH 14 |
| WK11 | Oct 29 | Factorial ANOVA and Mixed Designs | CH 14 | HW10  **Due 10/31** |
| Oct 31 | Review for Exam III | CH 12-14 | Study for Exam III |
| WK12 | Nov 5 | **EXAM III (Focus on ANOVA)** | | |
| Nov 7 | Correlation & Regression | CH 15 & 16 | HW11  Due 11/14 |
| WK13 | Nov 12 | Multiple Regression | CH 16 | HW12  Due 11/19 |
| Nov 14 | Hypothesis Testing with Correlation and Regression | CH 16 |
| WK14 | Nov 19 | Chi-Square Tests | CH 17 | HW 13  **Due 11/21** |
| Nov 21 | Review for Exam IV | CH 15-17 | Study for Exam IV |
| WK15 | Nov 26 | **THANKSGIVING BREAK: NO CLASS** | | |
| Nov 28 |
| WK16 | Dec 3 | **EXAM IV (focus on Correlation, Regression, & Chi-Square)** | | |
| Dec 5 | Putting it all together: The General Linear Model | N/A | **Final Project Due!!** |
| **FINAL EXAM WEEK** | | | | |