

# PSYCH 212A: Experimental Methods and Data Analysis II \*

## Spring , 2012

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**Office Hours:** Mon & Wed 11 :30am – 12 :15pm  
 Thurs. & Fri. 10:15am – 11 :00am  
 (or by appointment)      **CLASS MEETINGS:** M,W & F 8:55am – 10:05am

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**\*NOTE: This syllabus is subject to change at the discretion of the instructor**

### Course Overview:

This course is a direct continuation of PS211. This course focuses on scientific methodology as the means by which knowledge within the field of psychology (and others) is advanced. Students will learn about, and develop skills in employing principles of research methodology and statistical analyses, the main tools of the research psychologist. The course will be highlighted by the completion of the intensive individual independent research project begun in PS211 and a series of labs to introduce critical skills and knowledge regarding analysis and interpretation of data collected under a variety of experimental conditions and the use of various inferential statistics. We will continue to explore critical thinking and writing with major emphasis on scientific writing and American Psychological Association (APA) format.

### Course Objectives:

1. To provide you with a thorough **knowledge base** in the scientific process, research methodology and the statistical tools used to summarize and interpret data, and the ability to use this knowledge to **make good decisions** regarding the choice and use of methodological and statistical principles.
2. To help you to understand the important **connection between research design and statistical analysis**, and the foundation they provide for real-world applications.
3. To **appreciate the critical, but limited role, of science** in helping us to understand our world.
4. To stimulate and challenge you to **think critically** and independently about the course material, and subsequently about information presented in studies and the media so that you will be educated consumers of knowledge. Specifically, to enable you to critique research studies.
5. To improve your **communication skills** (written, verbal, & listening) through various opportunities provided during the course. Particularly, you should develop greater skills in writing research reports in a "scientific" style, and in compliance with APA format.
6. To master the basics of **SPSS** (Statistical Package for Social Scientists) and **APA style writing**.
7. To foster the **abilities** to critique a piece of research, create a well developed research project independently, to write a proposal in APA format.

### Required texts:

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author. [REFERENCE: readings assigned as needed]

Cronk, B. C. (2010). *How to use PAWS Statistics: A step-by-step guide to analysis and interpretation* (6<sup>th</sup> ed.). Glendale, CA: Pyrczak Publishing. [REFERENCE: SPSS/PAWS]

Dunn, D. S. (2004). *A short guide to writing about psychology* (3<sup>rd</sup> ed.). Boston, MA: Longman / Pearson Publishers. [referred to in syllabus as DUNN]

Jackson, S. J. (2009). *Research methods and statistics: A critical thinking approach* (4<sup>th</sup> ed.). Belmont, CA: Wadsworth Cengage Learning Publishers. [referred to in syllabus as RMS]

Additional readings from texts and handouts (beyond those listed in course schedule) will be required throughout the course

### Other requirements:

- 1) Accessibility to your computer account file on the X drive and e-mail.
- 2) Register for the course on Blackboard.
- 3) **TWO (2) FOLDERS or BINDERS**

1<sup>st</sup>) **Research Folder** in which to organize: Research project notes, outlines, drafts, & final version of your individual paper. This should be a continuation from your PS211 research folder with all the materials from that semester as well.

2<sup>nd</sup>) **Assignment Folder** in which to store your assignments (e.g., stat problems, lab reports, etc.)

### Course Graded Requirements:

#### Three EXAMS (Each worth 15%):

The format for tests will be multiple choice, short answer, essays, and computational problems. Each exam may have a take-home component as well. Except for the final, the tests will cover all material covered in class and in the required readings for that specific testing period. However, you should realize that the material is cumulative by nature and so PS211 and other foundation material is critical and expected to be used if necessary. Therefore, DON'T fall behind! The final exam will be cumulative.

#### SPSS LABS & HOMEWORK ASSIGNMENTS (20%)

The best way to ensure that you can interpret statistics and understand their relationship to research design is to do lab simulations for as many of the inferential statistical tools as possible. The labs will be introduced throughout the week that we cover that inferential statistic. The week will culminate in your independent analysis and write up of the lab data. Each lab will be formatted in APA style and use the following structure:

- I. APA Title Page with descriptive title (including mention of IV & DV)
- II. Ending two paragraphs of an Introduction  
(a full intro is not required and you can use "mock" citations to set up your hypothesis)
- III. Results section (no more than one page)
- IV. Discussion section (no more than two pages)

Your grade will be the average of all lab grades dropping the lowest one of the six. Calculation assignments for most chapters will also be required and will provide model examples for some of the write up and

analysis check. These assignments will be collected and factored into each lab grade. We may also have assignments based on readings of actual empirical articles illustrating design and analysis issues.

## **RESEARCH PROJECT**

### **Research Materials, Conducting your Study, and Participation in Peer Studies (15%)**

Since research is not just about the write-up, but also about the design of the research, the process of data collection, treatment of subjects and data analysis, this portion of the grade will focus on your ability to create valid and effective materials (measures & stimuli) and handle the overall research PROCESS.

As part of this grade, to enrich your appreciation of science and methodology toward greater enlightenment about psychology, you will be asked to participate in some of your peers' experiments in class. If you are unable to participate or prefer not to, an alternative assignment will be provided upon request.

### **Revision and Improvement in the Introduction, Method, & Reference sections (5%)**

Your draft for these two sections from your PS211 efforts will require ongoing attention, refinement and revision. New relevant research emerges in publications and gaps in your literature will be noticed.

Address these independently and continuously. As you continue to monitor the research and create/refine your materials, your methodology may also change and require revision in the text of the Method section. Again, this is your study and you are responsible to be sure that changes are translated into your manuscript.

### **Results & Discussion Sections, Final Manuscript and Presentation (15%):**

This research project is the foundation of the course. It occupies a central role within the course schedule. The grade for this project can be influenced by the data collection and analysis processes; but primarily focuses upon revisions to the Introduction and Methods sections (this should be ongoing), and the write up of the Abstract, Results, Discussion, References, and Appendices. This grade will also be reduced if you miss any of the research conferences that may be scheduled. *Lastly, I encourage you to try to present your research project at the LVAIC Undergraduate Psych Conference and/or Moravian College's Scholarship Day . Details will be forthcoming. These opportunities will be removed if the research project is inadequate in terms of sloppy design.*

## **Course Policies:**

### **1) ACTIVE LEARNING:**

Active learning involves questioning the text and lecture material, contributing to discussion, sharing ideas and alternative perspectives. As a prerequisite to the active learning that will take place in the classroom, please arrive to class on time and prepared by having read the assigned chapter(s), and completing the assignments. Class participation is expected and highly encouraged. This is the best strategy for achieving many of the objectives laid out for the course. Those who commit themselves to such active learning are scholars. It is for this reasoning that excessive absences will be penalized as stated in policy #4 below.

Since mastery comes from practice, additional independent practice assignments (Fill-In Self Tests, Multiple Choice Self Tests, Self Test Problems in Jackson's chapters) are recommended. These I will leave to your mature decision-making, but encourage you to do the work you need to learn in order to master the material. For instance, we will have class time to discuss SOME of the problems in the back of the chapters, but the chapter questions are mainly to help you to reinforce the material and bolster your studying efforts; therefore, completion of additional problems may be warranted. Answers to many of the problems (odd numbered ones) are in the back of the text. Also, you can create your own examples and check them on SPSS to improve your mastery. **INCLUDE ANY OF YOUR EXTRA WORK IN YOUR RESEARCH**

ASSIGNMENT FOLDER – CLEARLY LABELED.

**2) LATE ASSIGNMENTS:**

LABS CANNOT BE MADE UP! If you miss a lab that will be counted as the one that you will drop. Beyond that, missed labs will count as a zero.

Other assignments and projects may be handed in **up to three days (NOT classes) late** (5 points deducted from the grade each day late). **When handing in an assignment late please indicate the amount of days late on the front cover along with your signature** – **without this late assignments will be considered incomplete ( I )**. Assignments may not be handed in after the third day late. Please, do not ask me to deviate from this policy. If you must miss class, drop off the assignment earlier, or send it with a classmate.

**YOU MAY NOT E-MAIL ME ASSIGNMENTS** - as evidenced by past experience – too much can go wrong. I encourage you not to procrastinate, and be sure to use your file on the student X: drive and back up your work!

**3) MAKE-UP TESTS:**

LABS CANNOT BE MADE UP! If you miss a lab that will be counted as the one that you will drop. Beyond that, missed labs will count as a zero.

In order to avoid receiving a zero on a missed test you must provide notification and verification. Notify me beforehand, or as soon as possible. Notification more than two days after the exam is **not** acceptable. Also, if you miss a test you **MUST** provide appropriate documentation (Drs.' note, court order, family note upon death of a family member, etc.). Due to the awkwardness, in some cases I will not ask for such documentation; however, realize **that if such documentation is not presented, the highest score that can be achieved on a test is a 70**. Make up tests will be different than those administered during the normal schedule. I reserve the right to schedule make-up tests for 7:30AM on a weekday or weekend and to use an oral exam format.

**4) ATTENDANCE:**

Class attendance is expected. Class lectures and demonstrations will supplement text material. Excessive absences will impact directly on your final grade. After three missed classes, each class missed will reduce your final grade by two points. You are responsible for getting missed notes, assignments, and relevant in-class announcements in a timely manner. Contact Student services if you must miss multiple classes for extenuating circumstances.

**5) EXCUSES:**

Given the nature of the course and its emphasis on mastery skills that are critical for upper level study in psychology, I can not pardon work or substitute with extra credit other than that which is relevant to the course and offered to all. In the spirit of fairness to ALL students I must be consistent with the policies laid out in this syllabus and ask you to be familiar with and respectful of them.

**6) ACADEMIC INTEGRITY:**

Academic integrity is a core value of the college and is expected. Cheating and plagiarism will not be tolerated. It is **my contractual agreement** with the college that I am to report all **suspected** cases of plagiarism and cheating. Plagiarism is the intentional misrepresentation of someone else's work as your own. This includes transcribing sentences or paragraphs belonging to another author directly from another written source and suggesting they are your own words, quoting directly from a published work without giving the author credit (i.e. proper citation), using or "borrowing" another student's work, buying a paper from a professional service, etc. The policy of the department is that the student must keep all note cards

and rough drafts until given a grade for that course!!! Again, be sure to back up computer disks. Evidence of plagiarism and cheating will be dealt with in accordance with the college policy on academic honesty in the *Student Handbook*. One specific issue pertaining to this course is that **students may NOT use calculators that automatically solve for any of the statistical tests that we are learning this semester.**

If you use any prohibited calculators for an exam, you will receive a zero for that exam. If you are unsure whether your calculator is appropriate, please have the calculator approved by the instructor.

#### 7) SPECIAL ACCOMMODATIONS:

Should you require special accommodations for a disability, please arrange an appointment with the instructor at the beginning of the semester. Documentation of a disability will be required for special accommodations to be arranged in conjunction with the Learning Services Office. Students who wish to request accommodations in this class for support of learning disabilities and/or ADHD, should contact Mrs. Laurie Roth, Director of Learning Services, 1307 Main Street (ext. 1510).

Students who wish to request accommodations for support of other disabilities, should contact Dr. Ron Kline, Director of the Counseling Center, 1307 Main Street (ext. 1510).

Accommodations cannot be provided until authorization is received from the appropriate disability support provider on campus.

#### 8) SUMMARY OF GRADING SYSTEM:

EXAM 1	15%
EXAM 2	15%
FINAL EXAM	15%
SPSS LABS	20%

#### RESEARCH PROJECT GRADE COMPONENTS:

Research Materials, HSIRB Process, Conducting the Study, Analysis Plan, Being Resourceful	15%
Improvement in Intro & Method Sections	5%
Results & Discussion Sections, Final Manuscript and Presentation	15%

#### 9) LEARNING SERVICES

The Learning Service Office “provides assistance to students who are experiencing academic difficulties” (Student Handbook). If you feel you need special services through this office, you may call 610-861-1510 or visit their office. Also, I can work with you to arrange to request assistance from former students from the course.

10) The following **grading scale** will be used in the course:

A : 93-100	C : 73-76
A-: 90-92	C-: 70-72
B+: 88-89	D+: 68-69
B : 83-86	D : 63-66
B-: 80-82	D-: 60-62
C+: 78-79	F : Below 60

Please see the Student Handbook for verbal descriptions of the criteria for letter grades.

### 11) **EXTRA CREDIT:**

You will be required to participate in two research projects. This experience allows you to view the research process (a critical tool for the discipline of psychology) first-hand in various experimental contexts.

All the research studies will have been reviewed and approved by a Human Subjects Institutional Review Board (HSIRB) Committee; however, if you have objections to participating in research, you may arrange to complete an alternative, written assignment, which will involve reading a psychological article. In order to do the alternative assignment, you must meet with me to arrange it **by Monday March 12th**. After that point, you may still have the opportunity to complete the research requirement by participating in experiment sessions, but you will not be able to do a written assignment to fulfill this requirement. More information about research participation (e.g., how to sign up) will be provided later in the semester, when experiment opportunities start to become available. Failure to complete the required participation (or the alternative assignment) will result in a **reduction of your class grade by 1/3<sup>rd</sup> letter grade** (e.g., from a B to a B-). The entire required hour needs to be completed to avoid this deduction (i.e., completing ½ hour only will still result in the full deduction).

When you sign up for a research experiment, please be sure to record the time and location of the session, and all other relevant information on the pink sheet that will be provided. This information will need to be completed on the pink form and submitted toward the end of the semester. As many experiments require that students begin a task at the same time, please plan to show up on-time for your sessions. Showing up late may result in your not being able to participate in the experiment!

If you fail to attend an experiment session for which you signed up, the required hours of research participation will increase to 2 hours. If you then fail to show up a second time for a scheduled experiment session, then you will forfeit all extra credit opportunities (including extra research hours you already completed for extra credit in the course) and will face a **reduction of your class grade by 1/3<sup>rd</sup> letter grade** (e.g., from a B to a B-).

### **Extra Credit via Research Participation:**

Students may earn up to four hours of **ADDITIONAL** extra credit for participating in research beyond the requirements outlined above. Each hour of credit earned will increase your worst semester exam grade by 3 points (thus capped at 12 points).

NOTE: In-class experiments do not count to earning extra credit nor research participation requirement.

### 12) **Minimum expectations for student learning & study practices for PS212:**

a) As a prerequisite for upper level courses in psychology and due to its rigor of combining both statistics and methodology – this course should have a high priority for you in terms of your time management.

b) You must allocate a time and place to study for this course. Studying cannot be done in snippets. I recommend **at least** five study sessions of **at least** one hour (take a break if working longer in a single session) per week. What is needed may vary from individual to individual. This is in addition to the assignments and independent research work, and any group study work recommend under #5.

c) You must read before class or you will not fully comprehend the lectures. Your reading and studying goal should go beyond comprehending – you must eventually be able to speak the language of research.

- d) Try to form study groups and meet on a regular basis in order to capitalize on different perspectives and examples.
- e) I expect strong writing to be displayed in your assignments and projects. Spelling, grammar, and structure are always relevant, and will therefore be a large source of the grading of assignments and the research project.
- g) Commit to the policies, procedures, and spirit of the syllabus. Please consult the relevant parts of the syllabus when necessary before discussing concerns with me.

### **Relevant Quotes:**

*There are three types of lies: lies, damn lies, and statistics.*

---Mark Twain

*Probability is like the cane that the blind man uses to feel his way. If he could see, he would not need the cane, and if I knew which horse was the fastest, I would not need probability theory.*

---Stanislaw Lem

*I guess I just thought science was automatically so much more exact! The fact that data can be misleading or a poor indicator since it is based on estimates and sampling, really gets to be a tough thing to wrap your arms around.*

--- Anonymous student thinking about their stats class

## PSY212 Syllabus

DATE	TOPIC	ASSINGMENTS & READINGS
Monday 1/16	Organizational Meeting and Re-focusing on "Task Lists"	
Wed. 1/18	HSIRB Proposals revisited Outlines and other tools of revision	Read syllabus and look over sample script DUNN pp 67 - 78
Fri. 1/20	Research Projects: Collaboration and Progress	PS211 Final Take Home Exam Assignment Due
Monday 1/23 Wed. 1/25	Group Review of Studies Piloting Experiments	Revised HSIRB & Measures
Fri. 1/27	Method Script Review Results sections Hypothesis Testing: Overview and the z test	Draft of Method Script DUNN: pp. 98- 102; Chpt. 6 <b><i>DUE: Final Draft of Measures, Materials &amp; HSIRB Proposal</i></b>
Mon. 1/30	Introduction to Inferential Statistics Sample Mean Comparison Demo	RMS: Review Hypothesis testing in Chpt. 7 (pp. 183-191) RMS: Chpt. 8
Wed. 2/1 Fri. 2/3	Continued (Correlation Significance!) Continued	Review SPSS/PAWS Section 6.1 & 6.2
Monday 2/6	<b>LAB #1</b> (z test / one sample t test)	
Wed. 2/8	Inferential statistics: Two-Group Designs	RMS: Chpt. 10 (pp. 248 – 264) Review SPSS/PAWS Section 6.3 & 6.4
Fri. 2/10 Monday 2/13	t-tests for independent and correlated groups continued <b>LAB #2</b> (t-tests for independent and/or correlated groups)	
Wed. 2/15	Exam One Review	DATA COLLECTION SHOULD COMMENCE!



Fri. 2/18	<b>EXAM ONE</b>	
Monday 2/20	Experimental Designs with More Than Two Levels of an Independent Variable	RMS: Chpt. 11
Wed. 2/22	Continued	Review SPSS/PAWS Section 6.5 & 6.7
Fri. 2/24	Discuss Data Collection and Lab #3	
Mon. 2/27	<b>LAB #3</b> (One Way ANOVA)	
Wed. 2/29	Complex Experimental Designs	RMS: Chpt. 12
Fri. 3/2	continued	
WEEK OF 3/5 - 9	<b>SPRING BREAK</b>	
Monday 3/12	Data Sets for Research Projects	Data Sets should be configured
Wed. 3/14	Results / Discussion sections & Revisions of Intro/Method Two Way ANOVAs	DUNN pp. 44 – 50; 70 - 79 Statistical Analysis Plan DUE Review SPSS/PAWS Section 6.6 & 6.8
Fri. 3/16	continued	
Monday 3/19	<b>LAB #4</b> (Factorial Designs → Two Way ANOVAs)	
Wed. 3/21	Discuss of Experiments & APA Style Nuances	DUNN Review Chpt. 7
Fri. 3/23	Discuss Revisions of Intro and Method sections Discussion of Experiments	Bring APA Manual today and Fri. 3/23 <b>DATA COLLECTION SHOULD BE COMPLETE!</b>
Monday 3/26	Research Analyses & Reliability / Validity revisited	RMS: pp. 66-68; 71, 74; & SPSS/PAWS Chpt. 8
Wed. 3/28	Review for Exam Two	
Fri. 3/30	<b>EXAM TWO</b>	
Monday 4/2	Tables & Figures	DUNN – Chpt. 8; Bring APA Manual
Wed. 4/4	continued	Results Section without Tables & Figures Due

Review SPSS/PAWS Chpt. 4

Fri. 4/6  
Monday 4/9

EASTER BREAK  
EASTER BREAK

Wed. 4/11  
Fri. 4/13

Beyond Writing: Presenting Psychological Research  
continued

DUNN – Chpt. 10

Monday 4/16

Quasi Experimental Designs & Single Subject Designs

RMS: Chpt. 13

**FINAL RESEARCH PROJECTS DUE within folders/binders – must be submitted at start of class!**

Wed. 4/18  
Fri. 4/20

Quasi Experimental Designs continued / Research Projects  
Quasi Experimental Designs continued / Research Projects – continued  
Overview of Nonparametric Statistics compared to Parametric

SATURDAY, April 21<sup>st</sup>: *LVAIC Undergraduate Psychology Conference* at Cedar Crest College

KEYNOTE ADDRESS: Dr. Karyl Swartz, Director of the Center for Scientific Review's Division

Of AIDS, Behavioral and Population Sciences at the NIH (Natl. Institute of Health)

Conference website: <http://www.cedarcrest.edu/lvaicpsychconference>

Mon. 4/23

Nonparametric Statistics

Review RMS: pp. 216-218; 269-72

Review SPSS/PAWS Chpt. 7

Wed. 4/25

**LAB #5** (Nonparametrics – Chi-Square)

Fri. 4/27

Closure, Wrap Up & Review for Final Exam

**FINAL EXAM MONDAY 4/30, 8:30AM, PPHAC 113**