

INTRODUCTION TO STATISTICS AND RESEARCH METHODS

<u>PROFESSOR</u>	<u>OFFICE &amp; HOURS</u>	<u>E-MAIL</u>	<u>CLASS HOURS</u>	<u>LOCATION</u>
Jelani Mandara	Annenberg 107 M 11:00 – 12:00	j-mandara@northwestern.edu	M/W 9:30 -10:50	Fran. Searle 1441
Fatima Varner	None	f-varner@northwestern.edu		
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**GENERAL COURSE OBJECTIVES:**

1. To teach you the logic, goals and concepts of statistics.
2. To teach you how to choose and compute the proper statistics to analyze various types of data.
3. To teach you how to correctly interpret statistical results.

**TEXTBOOKS:**

Spatz, C. (2005). Basic Statistics: Tales of Distributions (8<sup>th</sup>). Wadsworth.

**COURSE REQUIREMENTS:**

<u>COURSE REQUIREMENTS:</u>	<u>POINTS:</u>	<u>DATES DUE:</u>
1. HOMEWORK	40	See below
2. MIDTERM EXAM	110	2/12
3. COMPREHENSIVE FINAL EXAM	200	3/15 (9:00 AM)
4. EXTRA CREDIT SURVEY	25	TBA

**GRADING:**

A = 350 - 325 (93%) B+ = 314 - 304 (87%) C+ = 279 - 270 (77%) D = 237 - 175 (50%)  
 A- = 324 - 315 (90%) B = 303 - 290 (83%) C = 269 - 255 (73%) F = 174 or below  
 B- = 289 - 280 (80%) C- = 254 - 238 (68%)

**COURSE POLICIES:**

1. Everyone will be treated as an adult. Therefore, I will not accept any childish excuses for you not getting lecture notes, handouts and/or assignments. They are your responsibility, not your parents or friends and certainly not mine. Furthermore, if you come to class, come on time and plan to stay the entire time.  
**NOTE:** Much of what will be covered in lecture will not be in your textbook or handouts.
2. Homework will be due each week at the **beginning** of class, unless I notify you otherwise. Each assignment will be worth 5 points. See below for assignments. Late homework will not be accepted. The homework assignments are designed to force you to read and study the material **before** you come to class. Thus, you may not understand all of the homework, but the answers are in the back of the book. Your SAT scores suggest that you should be able to understand most of it if you study.
3. We are trying to cover an enormous amount of material in 10 weeks. Thus, the exams will be very intensive and comprehensive! You will need to know how to choose and compute the proper statistics to analyze various types of data, identify the relevant variables and designs and how to properly interpret what you have done. You will also need to know all the definitions in detail and how to apply the information to real world situations (i.e., not just regurgitate definitions). Make-up exams will only be given in cases of **extreme** circumstances beyond your control and in cases when you inform me **before** the exam.  
**NOTE:** If you study hard, come to lecture, and do the homework, you will learn a great deal of statistical, scientific, and critical thinking. This is what you need to succeed in graduate, law or medical school.
4. Check Blackboard for course handouts, old exams, study guides, and other resources.
5. You will need a calculator with at least 2 memories. You do not need an expensive one (e.g., < \$40).

6. Students in this course are expected to comply with the policies found in the booklet, "Academic Integrity at Northwestern University: A Basic guide". For details visit: <http://www.northwestern.edu/uacc/>.

We will cover the topics below. The dates are approximate, but I will try to stay on course. I will drop material from the lecture if we run out of time, but you will still be responsible for covering **all** the readings unless I notify you otherwise. All readings are from the Spatz (2005) text and handouts, unless otherwise notified. We have to rush to get all of the material in, so read and study the chapters before class.

### LECTURE SCHEDULE

<u>DATE</u>	<u>SUBJECT</u>	<u>CHPTS</u>
3-Jan	Introduction, Scientific Method, Causation & Methods of Testing Theories	
8-Jan	Statistics: General Overview, Variables	1
10-Jan	Data, Distributions, Entering Data	2
15-Jan	<b>NO CLASS – MLK DAY</b>	
17-Jan	<b>NO CLASS – JM DAY</b>	
22-Jan	Central Tendency, Variability	3
24-Jan	Z-Scores, Theoretical & Normal Distributions	4, 6
29-Jan	Z-Scores, Theoretical & Normal Distributions	4, 6
31-Jan	Correlation & Linear Regression	5
5-Feb	Correlation & Linear Regression	5
7-Feb	Review	1 - 6
12-Feb	<b>MIDTERM EXAM (9:40 – 10:45)</b>	1 - 6
14-Feb	Experiments, Sampling Distributions, Hypothesis Testing-General Overview	7
19-Feb	One Sample Designs (T-test, Effect size, Confidence Interval), Errors, $p$ , $\alpha$ , $\beta$	8
21-Feb	Two Independent Samples Designs (T-test, Effect Size, CI), power	9
26-Feb	Two Correlated Samples Designs (T-test, Effect Size, CI), power	9
28-Feb	Three Independent Samples Designs (1-Factor ANOVA, Post Hoc)	10
5-Mar	Three Independent Samples Designs (1-Factor ANOVA, Post Hoc)	10
7-Mar	Review	1 - 10
15-Mar	<b>FINAL EXAM (Thursday, 9:00 – 11:00 AM)</b>	1 - 10

### HOMEWORK

<u>DATE</u>	<u>TOPIC</u>	<u>PROBLEMS DUE</u>
10-Jan	Variables, Graphs, Skew	Chpt. 1: 1 – 10, Chpt. 2: 1 - 15
29-Jan	Central Tendency, Variability, Z-scores	Chp. 3: 1-31, Chp.4: 1-6, 10-12, Chp. 6: 1 – 4, 7 - 28
7-Feb	Correlation, Regression	Chpt. 5: 1 - 23
12-Feb	Review	Practice Midterm Exam
19-Feb	Sampling Distributions, Hypothesis Testing	Chpt. 7: 2, 4, 8, 9, 16, 17, 20, 23, 25,
26-Feb	One Sample Designs	Chpt. 8: 2- 6, 8-16, 22, 24
28-Feb	Two Sample Designs	Chpt. 9: 2, 3, 7, 11, 13, 14, 18, 19, 22, 25, 27
7-Mar	Three Sample Designs	Chpt. 10: 2, 4, 7, 9, 11, 13, 17, 19, 22