Syllabus for MATH 2280, Statistics with Software
Northeastern University, Fall 2015

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Office hours: Mondays, Wednesdays and Thursdays: 3:15 – 4:15pm.

COURSE OBJECTIVE:
The goal of this course is to be able to understand the basic concepts of statistics and be able to apply statistical thinking in various applications. In this course, the student should acquire the ability to carry out a study, including formulating the problem, designing the study properly, collecting and analyzing data with the help of a computer, and drawing conclusions. Specifically you will learn to:

- Organize and present data in a clear and logical manner;
- Design proper data collection, using randomization;
- Summarize the data through numerical and graphical methods;
- Do basic probability, including the normal and binomial distributions;
- Understand basic statistical terminology and be able to communicate your results;
- Formulate research problems into statistical language and choose appropriate procedures;
- Carry out data analysis with the help of computer software.

REQUIRED MATERIALS:

Text and Online Homework Access Code: STATISTICS WITH SOFTWARE by Alan Bluman. First Custom Edition for Northeastern University bundled with Connect (the online homework system).

Note: if you are comfortable using the electronic version of the text then you do NOT need to purchase the textbook. You will need to get online (www.connectmath.com) to purchase Connect with the eBook.

The course ID for Connect is: FCWDX-HNGNG

Strongly Recommended Materials: A graphing calculator; the TI-83 or TI-83 Plus or TI-84 Plus.

GRADE: The course grade will be determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>ICPs and Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Four Exams</td>
<td>40%</td>
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<tr>
<td>Final</td>
<td>40%</td>
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Letter grades are determined numerically:

A: 93-100,  A-: 90-92,  B+: 87-89,  B: 83-86,  B-: 80-82,  C+: 77-79,
COURSE POLICIES:

**Academic Honesty:** Collaboration on tests and exams is not allowed. From Student Code of Conduct (see http://www.northeastern.edu/osccr/academicintegrity): “A necessary prerequisite to the attainment of the goals of the University is maintaining complete honesty in all academic work. Students are expected to present as their own only that which is clearly their own work in tests and in any material submitted for credit. Students may not assist others in presenting work that is not their own. Offenders are subject to disciplinary action.” For more on Academic Integrity see: http://www.northeastern.edu/registrar/courses/cat1213-univ-proc.pdf

**Attendance:** Students are expected to attend all classes, and are responsible for all the information given when they are absent. The best way to learn the material is to attend *every* class, and pay *full* attention in class. In this course, if you miss four classes, you will be dropped two letter grades from whatever you attain as a final average. Missing six or more classes, you will be asked to withdraw from the class.

The use of electronics during the class period is strongly discouraged, except for note-taking purposes. **Any student who fails to abide by this policy will lose 1% of the final grade each time this policy is violated.**

**Homework Exercises:** You have homework exercises that must be completed for each section that we cover in the course. The homework will be done on the Connect website: www.connectmath.com. There is not a time limit on the homework, but there is a **deadline** (posted in Connect). Homework assignments can be printed so that you may work on them offline. You may work on the homework without submitting it, then leave and go back to it at another time. When you have finished the homework, just simply click the Submit Quiz button in order to grade the assignment. You can redo any assignment as many times as you like during the week that it is open to get a better grade. Connect is setup to record your highest score of all attempts on that assignment.

**If you ever feel your homework was graded incorrectly** due to syntax (i.e. the Connect program misinterpreted your answer) please let me know **within one week of the due date** with the homework problem number and the assignment number. I will go in and look at your answer and give back points accordingly. Never be shy to ask for partial credit or points back because I’m happy to look at the work you’ve done and see if there is anything we can do.

**ICPS:** An in-class problem set (ICPS) will be given at least once a week.

**Exams:** There will be four one-hour Exams, the best three will be counted and a two-hour, cumulative, departmental final exam. No student will be granted a request for a special final exam unless it is due to a registrar created conflict. If you miss either of these exams, for any reason other than a university sanctioned absence, you will receive a grade of zero, as there will be no make-up exams given. Our final exam is scheduled for TBA. A plane ticket home will not excuse you from this exam, so please plan accordingly. There is no **“extra credit work”** or **“special project”** available to make-up for poor grades at the end of the semester.

If you have a concern about this course that cannot be resolved by speaking with your instructor, you should contact the Teaching Director, Prof. Massey, at d.massey@neu.edu

The Mathematics Department Tutoring Center is in Room 540B, Nightingale Hall http://www.math.neu.edu/undergraduate-program/mathematics-tutoring-services. This is walk-in tutoring; no appointment is necessary. Tentative schedule is Monday to Thursday 10am-8pm, Friday 10am-1pm. The tutoring start full time on September 14, you can sign-up for appointments on http://neumath.mywconline.com. However, even if the schedule looks booked, you can still drop-in for help. If there is a discrepancy between how the tutors present material and how your instructor presents material, you should follow your instructor’s presentation, but you should discuss the matter with your instructor.

We encourage students with disabilities, including “invisible” disabilities like chronic diseases or learning disabilities, to discuss with your instructor, after class or during office hours, appropriate accommodations which might be helpful for you. Your disability must be verifiable. The Disabilities Resource Center (20 Dodge Hall, ext. 2675) can provide you with information and other assistance.

**Note:** It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class.
Tentative Academic Calendar Fall 2015

Course: MATH 2280

9/7-9/11  Sec 1.1 Descriptive and Inferential Statistics 1, 2, 4-8
         Sec 1.2 Variables and Types of Data 9, 10, 11-16
         Sec 2.1 Organizing Data 5-8, 9, 10, 14, 26
         Sec 2.2 Histograms, Frequency Polygons, and Ogives 2, 14, 20

9/14-9/18 Sec 2.3 Other Types of Graphs 4, 10, 14, 17
         Sec 3.1 Measures of Central Tendency 2, 6, 25, 27, 29
         Sec 3.2 Measures of Variation 6, 27, 29

9/21-9/25 Sec 3.3 Measures of Position (Standard Scores and Quartiles) 12, 14, 16, 30
         Sec 3.4 Exploratory Data Analysis 5, 9, 12

9/24  Exam 1 Chapters 1, 2, & 3

9/28-10/2 Sec 4.1 Sample Spaces and Probability 10-15, 21, 23, 24
         Sec 4.2 Addition Rules for Probability 3, 4, 7, 6, 10, 12, 14, 24
         Sec 4.3 Multiplication Rules and Conditional Probability 1, 2, 6, 8, 16, 20, 22, 27, 30, 35, 38, 43, 44, 50

10/5-10/9 Sec 4.3 Multiplication Rules and Conditional Probability, continued
         Sec 4.4 Counting Rules 3, 12, 18, 20, 22, 24, 43, 58, 63
         Sec 4.5 Probability and Counting Rules 3, 6, 7, 10, 12

10/12-10/16  10/12  Columbus Day, no classes
         Sec 5.1 Probability Distributions 7, 9, 11, 18
         Sec 5.2 Mean, Variance, Standard Deviation, and Expectation 2, 10, 16, 20

10/19-10/23 Sec 5.3 The Binomial Distribution 3, 8, 14, 16, 22, 24, 30
         Sec 5.3 The Binomial Distribution, continue

10/22  Exam 2 Chapters 4 & 5

10/26-10/30 Sec 6.1 Normal/Standard Normal Distributions 28, 34, 36, 40, 41, 43, 47, 48, 49, 50
         Sec 6.2 Applications of the Normal Distribution 6(a, c), 8(a, b), 16(a, b), 20 22, 24, 26, 36
         Sec 6.3 Central Limit Theorem (Distribution of Sample Means) 8, 16, 18(a, b), 22(a, b, c), 24 (a, b)

11/2-11/6 Sec 6.4 The Normal Approximation to the Binomial Distribution 5b, 7b, 10, 12, 20
         Sec 7.1 Confidence Intervals for the Mean When Sigma Is Known 3, 7, 12, 16, 20, 25
         Sec 7.2 Confidence Intervals for the Mean When Sigma Is Unknown 3, 8, 10, 16, 18

11/9-11/13 11/11  Veteran’s Day, no classes
         Sec 7.3 Confidence Intervals and Sample Size for Proportions 4, 8, 12, 16, 17, 20
         Sec 8.1 Steps in Hypothesis Testing 1(a, b), 5(a, b), 9, 10, 13(d)

11/16-11/20 Sec 8.2 z Test for a Mean: Traditional Method / P-value Method 2, 4, 8, 12, 15(b, c) , 16, 18
         Sec 8.3 t Test for a Mean 8, 12, 16, 19, 23
         Sec 8.4 z Test for a Proportion 3, 6, 12, 16, 17

11/23-11/27 11/23  Exam 3; Chapters 6, 7, & 8

11/25  Thanksgiving, no classes

11/30-12/4 Sec 9.1 Testing the Difference Between Two Means: Using the z-Test 4, 6(a-e), 8(a, b), 18, 20
        Sec 9.2 Testing Two Means of Independent Samples: Using the t-Test 2(a-e), 4(a-e), 8(a-e),10
        Sec 12.1 One-Way Analysis of Variance (ANOVA) 7-19 odd
        Sec 10.1 Scatter Plots and Correlation 11-27 odd
        Sec 10.2 Regression 11-27 odd

12/7-12/11 12/7 Exam 4; Chapters 9, 10, & 11

12/9  Last day of Fall Classes

12/11-12/18 Final Exam, TBA