

## **MAT 1272-D184 Statistics with Probability (3 cr, 3 hr) Spring 2014**

**Course Meetings:** M, W 8:30 - 9:45 AM (N702)

**Instructor:** Ezra Halleck

**Office Hours:** M 1-2, T 4-5 and by appt

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**Text:** *Elementary Statistics, 5th edition*, by Ron Larson and Betsy Farber, Prentice Hall

**Calculator:** A scientific calculator is required; a graphing calculator (TI 83 or higher) is preferred.

**Course Description:** Topics include sample spaces and probabilities, discrete (Binomial) and continuous (Normal, Student, Chi-Square) probability distributions, expectation and variance, confidence intervals, hypothesis testing, and correlation and regression.

**Prerequisite:** MAT 1180 or higher

**Course Specific Student Learning Outcomes:** At end of the semester, students will be able to

1. collect, organize and graph data as frequency tables or a histogram.
2. compute statistical parameters (mean, median, mode, average deviation, variance, and standard deviation).
3. identify the discrete (binomial) and the continuous (normal, t) bell-shaped distributions.
4. apply counting arguments to find probabilities of events.
5. apply the basic probability concepts and tools conditioning, contingency tables and trees.
6. determine if the data supports a hypothesis to a given level of significance.
7. find and interpret the least squares regression line as well as the correlation coefficient.
8. use chi-squared tests to determine goodness of fit and independence.

**General Education Student Learning Outcomes:** At end of semester, students will be able to

1. gather, interpret, evaluate, and apply information from a variety of sources.
2. understand and employ both quantitative and qualitative analysis to solve problems.
3. make meaningful and multiple connections between mathematics and other areas of study leading to a major or profession.
4. employ scientific reasoning and logical thinking.
5. communicate effectively using written and oral means.

**Academic honesty:** You are encouraged to work in groups on homework, but be able to explain *anything* you turn in. During an exam, showing someone else your work is cheating; you will be treated in the same way as the person who copies. It is your responsibility to cover your work.

**Cell phones:** Please turn *off* and place out of sight. If the instructor sees or hears a phone, he may ask that you hand it to him for the duration of class.

**Attendance:** You may miss no more than 3 classes. Lateness between 0 and 30 minutes counts as 1/2 absence. Once in class, stay for the full period; if you *leave early* without making prior arrangements, *you will be marked as absent*. Students who have been excessively absent and failed the course at the end of the semester will receive a WU grade if they have attended the course at least once. This includes students who stop attending without officially withdrawing from the course. Every withdrawal (official or unofficial) can affect a student's financial aid status, because withdrawal from a course will change the number of credits or equated credits that are counted toward financial aid.

**Set enough time aside each week:** You are expected to spend 3-6 hours outside the classroom each week reading the text, working on projects, doing homework and preparing for exams.

**Time problems?** Here is a **damage control priority list:**

1. *Read the section prior to the class in which it is covered.* This reading will facilitate your understanding and participation in class. In fact, while the instructor reviews homework and attendance is taken, you will be working on questions from the reading, which will form the basis for group discussion.
2. *Attempt at least some of the homework problems immediately after class,* so that you know how much of the class you understood.
3. *Take advantage of office hours:* If you are unable to attend the scheduled hours, make an appointment.
4. *Make use of the Atrium & Voorhees Learning Centers (approximately 9AM-8PM, M-Th, shorter hours on F & Sat):* While some of the tutors are advanced undergraduate students, many are adjunct faculty.

## **Grade components**

**Online participation (6%, 6 points):** You are expected to become members of the openlab, to join the course (2 points) and to contribute a significant and interesting posting before each of the 4 exams (1 point each).

**Book homework (12%):** You received separately a *list of problems*. It is posted on the openlab as part of this syllabus. On the 2<sup>nd</sup> and final exams, please submit your homework together with the provided checkoff sheet indicating exactly which problems you attempted and which ones you completed. Completing any homework problem means that you did all that you were asked to do and that your answer checks with the answer in the back of the book (if applicable).

**Best 2 of 3 regular Exams (40%):** A sample exam will be posted on the openlab one week prior to each exam. No makeup exams will be given. If you miss an exam, make sure you take the other two.

**Quizzes (12%):** At the beginning of each class, a quiz will be given based on the homework and the material presented in the previous class. Lowest grade will be dropped.

**Final Exam (30%):** A sample exam will be posted on the openlab two weeks prior to the exam. If you miss the final exam and have been failing the course, you will receive a WU or F. Otherwise, if you have a documented illness or emergency, you will have opportunity to take a makeup final exam (small fee).

## **Grade scale:**

93 – 100	A	77 – 79.9	C+
90 – 92.9	A-	70 – 76.9	C
87 – 89.9	B+	60 – 69.9	D
83 – 86.9	B	0 – 59.9	F
80 – 82.9	B-		

Day	Date	Statistics	Homework
1	1/27	<b>1.1</b> An Overview of Statistics <b>pages</b> 2-5, Examples 1 - 3 <b>1.2</b> Data Classification <b>page</b> 9, Example 1 <b>1.3</b> Data Collection & Experimental Design <b>pages</b> 16-22, Examples 1, 3 & 4	<b>P. 6:</b> 1 – 41 odd <b>P. 13:</b> 7 – 17 odd <b>P. 23:</b> 11 – 15 odd, 19 – 29 odd
2	1/29	<b>2.1</b> Frequency Distributions and Their Graphs <b>pages</b> 38 - 46, Examples 1 - 6	<b>P. 47:</b> 1 – 31 odd, 35, 39, 41
3	2/3	<b>2.2</b> More Graphs and Displays <b>pages</b> 53 - 57, Examples 1, 2, and 4	<b>P. 60:</b> 5, 9, 13, 15 – 19 odd, 23, 35, 37
4	2/5	<b>2.3</b> Measures of Central Tendency <b>pages</b> 65 – 68 and 71, Examples 1 - 6	<b>P. 72:</b> 1 – 11 odd, 17 – 21 odd, 25 – 29 odd
5	2/10	<b>2.4</b> Measures of Variation <b>pages</b> 80-83, Examples 1-4 (Use the formulas $\sigma^2 = \frac{N\sum x^2 - (\sum x)^2}{N^2}$ and $s^2 = \frac{n\sum x^2 - (\sum x)^2}{n(n-1)}$ for variance.)	<b>P. 90:</b> 1, 3, 7, 11, 13, 19, 25, 27
6	2/19	<b>2.5</b> Measures of Position <b>pages</b> 100 - 106, Examples 1, 3 - 7	<b>P. 107:</b> 1 -21 odd, 25 - 35 odd, 39 – 45 odd
7	2/20	<b>3.1</b> Basic Concepts of Probability and Counting <b>pages</b> 128 - 137, Examples 1 - 11	<b>P. 138:</b> 1, 3, 15 - 25 odd, 28, 29, 33 – 41 odd, 45, 55 – 61 odd
8	2/24	<b>3.2</b> Conditional Probability and the Multiplication Rule <b>pages</b> 145 - 149, Examples 1 - 5	<b>P. 150:</b> 7 - 19 odd, 23 – 31 odd
9	2/26	<b>3.3</b> The Addition Rule <b>pages</b> 156 - 160, Examples 1 - 5	<b>P. 161:</b> 1 – 25 odd
10	3/3	<b>First Examination (Sessions 1-8)</b>	
11	3/5	<b>3.4</b> Additional Topics in Prob. & Counting <b>pages</b> 168-173, Examples 1-9	<b>P. 174:</b> 7, 11 – 31 odd, 37, 43 – 47 odd
12	3/10	<b>4.1</b> Probability Distributions <b>pages</b> 190 - 193, Examples 1, 3 and 4	<b>P. 197:</b> 1 – 7 odd, 13 – 19 odd, 21 – 25 odd, 27 – 31 odd do part (a), 41
13	3/12	<b>4.1</b> Probability Distributions <b>pages</b> 194 - 196, Examples 5 – 7 (Use the formula $\sigma^2 = \sum x^2P(x) - \mu^2$ )	<b>P. 198:</b> 27 – 31 odd do parts (c) and (d), 35, 37, 43
14	3/17	<b>4.2</b> Binomial Distributions <b>pages</b> 202 - 208, Examples 1 – 3, 5, 6, 8	<b>P. 211:</b> 9-25 odd, 27-30 all (parts a, c & d), 33
15	3/19	<b>5.1</b> Introduction to Normal Distributions & the Standard Normal Distribution <b>pages</b> 236 - 240, Examples 1 – 3	<b>P. 244:</b> 9 - 15 odd, 19 – 25 odd
16	3/24	<b>5.1</b> Introduction to Normal Distributions & the Standard Normal Distribution <b>pages</b> 241 - 243, Examples 4 – 6	<b>P. 244:</b> 27– 37 odd, 41, 43
17	3/26	Review for exam	
18	3/31	<b>Second Examination (Sessions 9-16)</b>	
19	4/2	<b>5.2</b> Normal Distributions: Finding Prob. <b>pages</b> 249-250, Examples 1-2	<b>P. 252:</b> 1 - 23 odd

20	4/7	<b>5.3</b> Normal Distributions: Finding Values <b>pages</b> 257 - 261, Examples 1 - 5	<b>P. 262:</b> 1 - 37 odd
21	4/9	<b>5.4</b> Sampling Distributions and the Central Limit Theorem <b>pages</b> 266 - 273, Examples 1 - 6	<b>P. 274:</b> 11 – 35 odd
22	4/23	<b>7.1</b> Introduction to Hypothesis Testing <b>pages</b> 356 - 366, Examples 1 – 3, 5	<b>P. 367:</b> 11 – 25 odd, 28, 32, 38, 41, 43
23	4/28	<b>7.2</b> Hypothesis Testing for the Mean (Large Samples) <b>pages</b> 376 - 380, Examples 7 - 10	<b>P. 382:</b> 17 – 27 odd, 35 – 39 all, 41
24	4/30	<b>10.1</b> Goodness-of-Fit Test <b>pages</b> 540 - 545, Examples 1 - 3	<b>P. 546:</b> 1 - 15 odd
25	5/5	<b>10.2</b> Independence <b>pages</b> 551 - 555, Examples 1 - 2	<b>P. 557:</b> 1 – 17 odd
26	5/7	<b>Third Examination (Sessions 17-24)</b>	
27	5/12	<b>9.1</b> Correlation <b>pages</b> 484 - 488, Examples 1 and 4	<b>P. 495:</b> 1, 3, 9-13 odd, 21-27 odd (parts b & c)
28	5/14	<b>9.2</b> Linear Regression <b>pages</b> 501 - 502, Example 1	<b>P. 505:</b> 3, 5, 7 – 12 all, 17 - 23 odd
29	5/19	<b>Review</b>	
30	5/21	<b>Final Examination (Sessions 1-28, emphasis on 25-28)</b>	