

# Course Information Sheet

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**Course:** Math 153-01/Bus 240-01 - Probability & Statistics - 4 Credit/Contact Hours - Spring 2013

**IAI Code:** M1 902

**Delivery Mode:** Face-to-face

**Meeting Time:** TTh 10:00am-11:40am

**Meeting Place:** Room 2625

**Instructor:** Steve Kifowit, Rm 2305, Ph. (708) 709-3954

**Email:** skifowit@prairiestate.edu

**Web:** <http://prairiestate.edu/skifowit/math>

**Office Hours:** MW 1pm-2:30pm, TTh 1:15pm-2:15pm, or by appointment

**Text:** *Elementary Statistics*, 11th edition (2010); Triola

**Course Description:** This is an introductory course in probability and statistics. Topics covered include frequency distributions, measures of central tendency, measures of dispersion, standard deviation, correlation, elementary probability, regression lines, statistical inference, the binomial distribution, the normal distribution, the student t distribution, and the chi-square distribution. Computer software, such as MINITAB, is used. Comprehensive projects are assigned. Students who successfully complete this course cannot also receive credit for Math 115.

**Course Prerequisite:** Math 151 (College Algebra) with a C or better or equivalent.

## Course Goals/Objectives:

*General Education Objectives*---The mathematics component of general education focuses on quantitative reasoning to provide a base for developing a quantitatively literate college graduate. Every college graduate should be able to apply simple mathematical methods to the solution of real-world problems. A quantitatively literate college graduate should be able to:

- a.) interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them;
- b.) represent mathematical information symbolically, visually, numerically and verbally;
- c.) use arithmetic, algebraic, geometric and statistical methods to solve problems;
- d.) estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives and select optimal results; and
- e.) recognize the limitations of mathematical and statistical models.

*Specific Course Objectives*---In addition to meeting the general education objectives, every successful Math 153 student should be able to:

- 1.) organize, present, and describe quantitative data;
- 2.) solve computational and application problems involving basic probability theory;
- 3.) solve computational and application problems involving basic statistical theory;
- 4.) effectively apply knowledge of statistics through projects involving data collection and analysis; and
- 5.) use statistical software and computers to develop solutions and evaluate results in statistical analysis.

**Attendance Policy:** Regular class attendance is an essential component of successful learning. Students are responsible for prompt attendance and participation in all class meetings. If you miss class, you will not be allowed to make up any tests, quizzes, or assignments that you may have missed. All material covered in class is the student's responsibility.

**Grading:** Your grade will be based on your performance on three 100-point tests, a 150-point final exam, approximately ten 10-point quizzes, and miscellaneous problems and projects (0-50 points). Very roughly, tests count for about 55% of your grade, the final exam counts for about 27%, and quizzes count for about 18%. The grading scale is as follows:

A --- 88% and above

B --- 77% - 87%  
C --- 66% - 76%  
D --- 55% - 65%  
F --- below 55%

You may estimate your current grade at any time during the semester by computing the following percentage:  $100\% * (\text{Total points accumulated}) / (\text{Total points possible})$ . Please feel free to discuss your grade with me at any time during the semester. Throughout the semester, grades will be posted online at <http://www.engage.com/skifowit>.

**Homework:** Homework problems will be assigned on a daily basis. We will often discuss homework problems in class. Keep up to date on your homework! Homework problems will often show up on quizzes and tests.

**Quizzes:** Be prepared for a 10-point quiz on each Thursday, unless a test is scheduled. No make-up quizzes will be given. Your lowest quiz score will be dropped at the end of the semester.

**Tests/Exams:** Test problems will be similar to class examples, quiz problems, and homework problems. In addition to computational problems, tests may include multiple choice, true/false, short answer, and/or writing problems. You must show all work on all tests to receive full credit. **You must work individually on all tests.** No make-up tests will be given. At the end of the semester, your lowest test score will be replaced by two-thirds of your final exam score (if this helps you).

**Final Exam:** The final exam is comprehensive and will be worth 150 points toward your final grade. The final exam counts for more than 25% of your grade. Please take it seriously! See the lecture pace for the date of the final exam.

**Calculators:** The TI-83/84 Graphing Calculator is required for this course. We will also make use of computer software such as Microsoft Excel, Maxima, GeoGebra, or StatDisk (bundled with your text).

**Disability Statement:** Any student needing to arrange reasonable accommodations for a documented disability (learning, physical, psychological, or other) should contact the Disability Services Office (Room 1192).

**Religious Observance Accommodation:** Prairie State College is required to excuse students who need to be absent from class, examinations, study, or work requirements because of their religious beliefs, and provide students with a make-up opportunity, unless to do so would unreasonably burden the institution. Students must notify their instructor well in advance of any absence for religious reasons. If you require special accommodations for observance of a religious holiday, please notify me during the first week of the term.

**Misc. information:**

- 1.) The last day to withdraw from the course is April 12. For refund information, refer to the spring schedule book. If you wish to withdraw from the course, it is your responsibility to do so. Any student who does not come to class, yet fails to withdraw, will be given an F.
- 2.) You are expected to spend roughly 12 hours per week on coursework - 4 hours in class and 8 hours out of class. If you cannot make this commitment, you may want to reconsider taking this course.
- 3.) The grading scale will be strictly adhered to! Final percentages will be rounded to the nearest whole number.
- 4.) This is a fast-paced course! We will cover much material in little time. You are responsible for thoroughly reading the textbook and keeping up with the assigned material.

Course information, including tests, quizzes, and answer keys, can be found at <http://prairiestate.edu/skifowit/classes/m153.htm>



## MATH 153 TOPICAL COURSE OUTLINE

### I. Introduction to Statistics (4-6 hours)

- A. Uses and abuses of statistics
- B. Types of data
- C. Populations and samples
- D. Experimental design

### II. Descriptive Statistics (4-6 hours)

- A. Summarizing data
- B. Pictures of data
- C. Measures of central tendency
- D. Measures of spread

### III. Probability (4-6 hours)

- A. Empirical
- B. Theoretical
- C. Addition, multiplication, complement rules

### IV. Probability Distributions (6-8 hours)

- A. Random variables
- B. Mean, variance, and expectation
- C. Binomial distribution
- D. Normal distributions
- E. Normal distribution as an approximation to the binomial distribution
- F. Student's t-distribution
- G. Chi-squared distribution
- H. F distribution

### V. Central Limit Theorem (1-3 hours)

### VI. Confidence Intervals (4-6 hours)

- A. Large sample
- B. Small sample
- C. Proportion, mean, variance
- D. Difference between two means
- E. Difference between two proportions

### VII. Hypothesis Testing (5-7 hours)

- A. Parametric statistics
  - 1. One sample tests of proportion, mean, variance
  - 2. Two sample tests of proportion, mean, variance
- B. Nonparametric statistics (optional)

VIII. Linear Regression (3-6 hours)

A. Correlation

B. Linear regression equation

C. Prediction intervals

1. Explained and unexplained variation

2. Coefficient of determination

3. Standard error of estimation

4. Prediction interval for an individual measurement

D. Multiple regression (optional)

IX. Analysis of Variance (optional)

# Lecture Pace

## Math 153-01 - Probability & Statistics

Week 1	Jan 22 & Jan 24	Course information; Chapter 1	Statistical thinking, Types of data, Collecting data
Week 2	Jan 29 & Jan 31	Sections 2.1, 2.2, 2.3, 2.4	Collecting data, Frequency distributions, Statistical graphs
Week 3	Feb 5 & Feb 7	Sections 3.2, 3.3, 3.4	Measures of center, Variation, Boxplots
Week 4	Feb 12 & Feb 14	Sections 4.1, 4.2, 4.3, 4.4	Probability basics, Addition and multiplication rules
Week 5	Feb 19 & Feb 21	Section 4.5, 4.7; Review; <b>Test 1</b>	Conditional probabilities, Counting
Week 6	Feb 26 & Feb 28	Chapter 5	Random variables, Binomial distribution, Poisson distribution
Week 7	Mar 5 & Mar 7	Sections 6.1, 6.2, 6.3	Normal distributions
Week 8	Mar 12 & Mar 14	Sections 6.4, 6.5, 7.1, 7.2	Sampling distributions, Central Limit Thm, Confidence intervals
Week 9	Mar 19 & Mar 21	Sections 7.3, 7.4; Review; <b>Test 2</b>	Confidence intervals
Week 10	Mar 26 & Mar 28	<b>Spring Break---No class</b>	
Week 11	Apr 2 & Apr 4	Sections 7.5, 8.1, 8.2	Confidence intervals, Intro to hypothesis testing
Week 12	Apr 9 & Apr 11	Sections 8.3, 8.4, 8.5, 8.6	Hypothesis testing
Week 13	Apr 16 & Apr 18	Sections 9.2, 9.3, 9.4	Inferences from two samples
Week 14	Apr 23 & Apr 25	Section 9.5; Review; <b>Test 3</b>	Inferences from two samples
Week 15	Apr 30 & May 2	Sections 10.1, 10.2, 10.3	Correlation, Regression
Week 16	May 7 & May 9	Review/Catch-up	
*****	Thursday, May 16	<b>Final Exam</b> --- 10am-11:50am	

\*\*\* April 12 is the last day to withdraw \*\*\*

**Suggested Homework Problems**  
**Math 153-01 - Probability & Statistics**  
(Subject to changes)

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Section 1.2 #'s 7-18,23,25

Section 1.3 #'s 5-32

Section 1.4 #'s 5-27(odd)

Section 1.5 #'s 1-29(odd)

Section 2.2 #'s 5-15(odd),19,27

Section 2.3 #'s 5-8,11,19

Section 2.4 #'s 5-15(odd),23,25

Section 3.2 #'s 5-11(odd),21,23,29,31,33,35

Section 3.3 #'s 5,7,11,13,17,21,23,31,33,35

Section 3.4 #'s 4,5,7,9,11,15-18,29,35

Section 4.2 #'s 5,9,11,13,15,21,23,29,31,33,37,39

Section 4.3 #'s 5-11(odd),15,17,19,27-32,40,43

Section 4.4 #'s 5-11(odd),17,19,21,29,31,33

Section 4.5 #'s 5,7,9,11,23-26,27

Section 4.7 #'s 5-11(odd),17,19,25,27,35

Section 5.2 #'s 5,6,7,9,11,15,19,21,25,29

Section 5.3 #'s 5-13(odd),21-24,25,27,29,31,35,41

Section 5.4 #'s 5,7,9,11,17

Section 5.5 #'s 5-8,9,11,13

Section 6.2 #'s 5-16,17-35(odd),45-48

Section 6.3 #'s 5-12,13-29(odd)

Section 6.4 #'s 13,15,18,20

Section 6.5 #'s 5,7,9,11,18

Section 7.2 #'s 5-27(odd),31,35,37,41

Section 7.3 #'s 13,15,21,23,25,33,35

Section 7.4 #'s 5-11(odd),19,21,27

Section 8.2 #'s 9-49(odd)

Section 8.3 #'s 9,13,15,19,23,25

Section 8.4 #'s 9,13,16,17,19

Section 8.5 #'s 15,17,23,25,27

Section 10.2 #'s 13,17,19,21

Section 10.3 #'s 13,17,19,21,26

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