

COLORADO WOMEN'S COLLEGE of the UNIVERSITY OF DENVER

Syllabus for MATH 1160: Statistical Reasoning

Summer/2014: Tuesday Evenings/6:00-9:50 PM

Class Session Dates: June 17, 24, July 1, 8, 15, 22, 29, August 5, 12

PREREQUISITES: See Course Description, below. Students are responsible for completing course prerequisites before registering for a class. Students may be removed from a course for which they have not fulfilled the prerequisite course work.

COURSE DESCRIPTION: This course serves as an introduction to the fundamental concepts in statistics and probability as they apply to the social sciences, humanities, information technology and business disciplines. The course emphasizes statistical reasoning as it applies to decision-making and result interpretation as well as the use of probability in thinking about and solving problems. Topics include: presenting data using tables, charts and graphs; summarizing and describing data with numerical measures; sampling theory; fundamentals of probability and probability distributions; estimation theory and applications; decisions based on hypothesis testing; and regression and correlation analysis. This is a 4-credit course. Prerequisite is MATC 1100 or its equivalent.

COURSE OBJECTIVES: The objectives in this course are to:

1. engage in new, creative, and challenging ways of learning
2. gain greater awareness of one's own capabilities
3. increase awareness of, and comfort with math's place in the world
4. use math in the study of authentic situations
5. increase conceptual understanding of the discipline of mathematics
6. identify and build on one's own mathematical assets and strengths
7. develop a positive attitude toward mathematics
8. understand the relationship of mathematics to one's personal and professional life
9. develop problem-solving skills
10. develop a mathematical ability to reason and analyze
11. know the mathematics necessary to support learning in the Bachelors of Business Administration curriculum
12. use technology as a tool in the application of mathematical principles

Statistically, the students will be expected to:

1. explain what is meant by descriptive and inferential statistics
2. identify different statistical sampling techniques and know their specific utility
3. read, interpret and present statistical information in the form of graphs and charts
4. calculate and explain measures of central tendency and measures of dispersion
5. list the characteristics of a normal probability distribution and use the Empirical Rule
6. determine the probability that an observation is in a particular range of a normally distributed variable
7. define point estimate and construct a confidence interval
8. conduct formal hypothesis test for a population mean or proportion and interpret the results
9. calculate and interpret coefficients of correlation and coefficients of determination
10. compute and interpret least-squares equations and use for prediction
11. assess the goodness of a simple linear regression model

ACADEMIC INTEGRITY:

The Women's College fully endorses the University of Denver's Honor Code and the procedures put forth by the Office of Citizenship and Community Standards. Academic dishonesty—including plagiarism, cheating, and falsification of data and research—is in violation of the code and will result in a failing grade for the assignment or for the course.

As student members of a community committed to academic integrity and honesty, it is your responsibility to become familiar with the DU Honor Code and its procedures (www.du.edu/honorcode).

COURSE REQUIREMENTS (including points per requirement):

1. Class participation and attendance (25 points per class)	210 points
2. Homework (best seven of eight chapters, 30 points each)	210 points
3. Quizzes (best fourteen of sixteen, 20 points each)	280 points
4. Research Projects (three, 75 points each)	225 points
5. Final Exam (75 points)	75 points
6. Extra Credit for odd numbered exercises (½ point per problem)	30 points max

TOTAL 1000 points

COURSE POLICIES:

- Homework, composed of reading and problem solving, will be assigned at each class.
- There will be no make-up quizzes for those missed.
- All papers submitted for grading must be on 8½x11 paper with the heading on the upper left-hand corner.
 - Student name*
 - Course name*
 - Instructor name*
 - Paper identification*
 - Date paper is due*
- Each homework group or take-home exam must be submitted separately and stapled.
- Homework and Research Projects have due dates. The grade on work handed in late will be reduced by 10% for each day (or fraction thereof) it is late.
- Students are encouraged to use the Open Math Labs as appropriate.
- The grading scale for the course is as follows.

A 1000-950	B+ 899-870	C+ 799-770	D+ 699-670
A- 949-900	B 869-830	C 769-730	D 669-630
	B- 829-800	C- 729-700	D- 629-600
- A grade of incomplete will be granted only under special circumstances.
- Classroom eating and drinking should be transparent.
- The academic environment should be free of distractions.
- Mutual respect, that is, respect for each other as students and instructors, is expected. Our teaching/learning situation is based on a working and effective partnership. Therefore, we respect our fellow students and their right, which is the same as ours, to claim their education.
- Missing any class, or any part of a class, will most surely have a significantly negative effect on the learning process and will reduce the course grade significantly.

ATTENDANCE AND PARTICIPATION

- Attendance is mandatory in all class sessions. Active participation in class and online discussions is also required and will be a determiner in a student's final grade. An absence, for any reason, will result in forfeiting points for in-class student presentations. These may not be made up in another class session. If an emergency arises, it is the student's responsibility to contact her instructor.
- A grade of incomplete will be granted only under special circumstances as determined by the instructor.

LAPTOP USE IN THE CLASSROOM

- In order to create and maintain an optimal learning environment in the classroom, students should use laptops appropriately as directed by the instructor for the purposes of the course. Work done on laptops that is not relevant to the class can hinder the process of communication and shared discussion of ideas that require full engagement by all participants. Such distractions can build barriers to that sense of physical and intellectual community so important in TWC classrooms.

ADA ACCOMMODATIONS

- Students who require accommodations under the Americans with Disabilities Act must contact the instructor to discuss their needs. Failure to notify the instructor immediately may hinder the college's ability to accommodate accordingly. Students with learning disabilities should also contact the University Disability Services Program at <http://www.du.edu/studentlife/disability/>. University Disability Services houses the Learning Effectiveness Program (LEP) and the Disability Services Program (DSP).

OBSERVATION OF RELIGIOUS HOLIDAYS

- Students wishing to observe a religious holiday not celebrated on the academic calendar may do so provided advanced written notice is given the instructor during the first two weeks of the quarter. With advanced written notice, the absence will be considered an excused absence. For additional information, contact DU's Center for Religious Services (<http://www.du.edu/crs/>).

COURSE TEXTS AND MATERIALS:

REQUIRED TEXTBOOK: The required textbook for this course is *Statistical Methods for the Social Sciences* by Agresti and Finlay, Fourth Edition, 2009. It is published by Pearson, Prentice Hall, with ISBN 978-0-321-65647-6.

REQUIRED CALCULATOR: The required calculator for this course is the TI-30XA SCIENTIFIC calculator produced by the Texas Instruments Company. Microsoft Office Excel functions will also be used.

REQUIREMENTS FOR THE FIRST CLASS: Please study the syllabus. Also read Chapter Two, pages 11-24 of the textbook. A True/False quiz over this material will be given at the beginning of the first class.

COURSE SCHEDULE:

	<u>Class Date</u>	<u>Class Activities</u>
Session One	June 17	Introductions Quiz #1 Discussion: Chapter 2: Sampling and Measurement Quiz #2
Session Two	June 24	Quiz #3 Discussion: Chapter 3: Descriptive Statistics Quiz #4
Session Three	July 1	Quiz #5 Discussion: Chapter 4: Probability Distributions Quiz #6
Session Four	July 8	Submit Research Project A (CH 3) Quiz #7 Discussion: Chapter 5: Confidence Intervals Quiz #8
Session Five	July 15	Quiz #9 Discussion: Chapter 6: Hypothesis Tests Quiz #10
Session Six	July 22	Quiz #11 Discussion: Chapter 7: Comparison of Two Groups Quiz #12
Session Seven	July 29	Submit Research Project B (CH 6) Quiz #13 Discussion: Chapter 9: Linear Regression and Correlation Quiz #14
Session Eight	August 5	Quiz #15 Discussion: Chapter 8: Association between Categorical Variables Quiz #16
Session Nine	August 12	Submit Research Project C (CH 9) Final Exam