

JOHNSON COUNTY COMMUNITY COLLEGE



Science, Health Care, & Mathematics Division
Course Syllabus
Math Department
Statistics
MATH 181-012, CRN 12369
Spring 2009

INSTRUCTOR INFORMATION:

Name: Mr. Scott Keltner
Telephone: (785) 865-8550 (cell)
(785) 542-3584 (home, NO CALLS AFTER 8:00 p.m. PLEASE!)
(913) 469-8500, ext. 7216 (JCCC VoiceMailbox)
E-mail: scottkeltner@eudoraschools.org or skeltne1@jccc.edu
Class webpage: <http://www.eudoraschools.org/keltner>
Classroom: OCB 306
Class Time: Monday & Wednesday, 6:00 – 7:15 p.m.

COURSE INFORMATION:

Credit: 3 hours
Course Type: Transfer
Prerequisites: MATH 171 College Algebra or MATH 173 Precalculus or an equivalent course with a grade of “C” or higher or an appropriate score on the math assessment test

TEXTBOOK:

Introductory Statistics, 8th Edition (2008) by Neil A. Weiss. ISBN: 978-0-321-41728-2.

SUPPLIES:

While one is not required for class, it is ***strongly recommended*** that students in this class have access to a graphing calculator. Recommended models include the Texas Instruments TI-83 or TI-84 series’ of calculators, but can include others. It is also recommended that students ***not*** use or have access to either the TI-89 or TI-92 series’ of calculators. Additional (out-of-pocket) expense considerations that students should expect in addition to course tuition, fees, and textbooks will range from \$10 to \$120.

CAVEATS:

1. The majority of mathematics courses are sequential. Students must earn a grade of C or higher in a prerequisite mathematics course to progress to its subsequent mathematics course.
2. If a student is found not to have successfully fulfilled the prerequisite(s) for this course, the student will be dropped from the course. He/she will be allowed to enroll in the appropriate level math course provided space is available for them.

COURSE DESCRIPTION:

This is a beginning course in statistical analysis, the skill of making sense of raw data—constructing graphical representations of data, developing models for making predictions, performing tests to determine significant change and finding intervals for population values. Students will learn the basis of descriptive statistics, probability, sampling, confidence intervals, distributions, hypothesis testing, regression, and correlation. Computer applications will be incorporated into course topics. 3 hrs./wk. A statistical package using the computer is a required part of instruction. No computer skills are necessary. NOTE: the

prerequisites of MATH 171 (College Algebra) or MATH 173 (Precalculus) require a grade of “C” or higher.

COURSE OBJECTIVES:

Upon successful completion of this course the student should be able to:

1. Critically read and analyze a basic statistical study.
2. Perform one-tailed and two-tailed hypothesis tests.
3. Perform a linear regression analysis.
4. Solve basic counting and probability problems.
5. Construct a confidence interval and explain its meaning.
6. Compute measures of central tendency and dispersion; explain the meaning of central tendency and dispersion as related to a problem.
7. Use a statistical package on a graphics calculator or a computer to carry out statistical procedures.

CONTENT OUTLINE AND COMPETENCIES:

I. Basic Descriptive Statistics: Organizing and describing data

- A. For a given set of data, draw a dotplot, histogram, stem-and-leaf diagram, and a boxplot.
- B. Describe the general shape of data, skewed left, skewed right, normal or other symmetric.
- C. Calculate the measures of central tendency including mean, median, and mode.
- D. Calculate the measures of dispersion including range, standard deviation, and interquartile range; explain the meaning of dispersion as it relates to a problem.
- E. Use a statistical package on a graphics calculator or a computer to enter data and analyze results.

II. Introduction to Probability: Finding the theoretical probability of an event

- A. Use probability notation including the “or” condition and the “and” condition.
- B. Determine whether or not two events are mutually exclusive.
- C. Determine whether or not two events are independent.
- D. Calculate conditional probabilities; explain the meaning of conditional probabilities; use conditional notation.

III. Random Variables: Determining probabilities of a random variable

- A. Determine the expected value and the standard deviation of a discrete random variable.
- B. Determine probabilities for a discrete random variable.

IV. Special Probability Functions: Using functions to solve probabilities of events

- A. Use the Binomial formula to solve probability problems with two outcomes and independent events.
- B. Use the Normal distribution to solve percent problems for normally distributed populations.
- C. Use the Normal distribution to solve probability problems for normally distributed random variables.

V. Random Sampling and Sampling Theory: Generating distributions for sample means

- A. Calculate the mean for a distribution of sample means.
- B. Calculate the standard deviation for a distribution of sample means.
- C. Perform a normal probability plot; describe the shape of the population distribution based on the plot.
- D. Analyze the Central Limit Theorem.

VI. Estimating the Mean: Using statistics to determine averages of a population

- A. Construct confidence interval for a population mean with known population standard deviation; explain the meaning in terms of the problem.
- B. Construct a confidence interval for a population mean with unknown population standard deviation; explain the meaning in terms of the problem.
- C. Construct a confidence interval for a population proportion; explain the meaning in terms of the problem.

VII. Hypothesis Tests: Finding significance

- A. Perform a hypothesis test for a sample mean with known population standard deviation.
- B. Perform a hypothesis test for a sample mean with unknown population standard deviation.
- C. Perform a hypothesis test for a sample proportion.
- D. Perform a hypothesis test with more than two categories for procedures using the Chi-square distribution. (Optional)
- E. Explain Type I and Type II errors with respect to a problem. (Optional)
- F. Calculate the P-value of a hypothesis test; explain the meaning in terms of the problem.

VIII. Linear Regression: Making predictions with linear data

- A. Calculate a linear regression equation; explain the meaning in terms of the problem.
- B. Use a linear regression equation to make predictions about data.
- C. Calculate the coefficient of determination for a linear regression equation; use the coefficient of determination to explain the strength of the regression equation.

COURSE REQUIREMENTS/ TENTATIVE COURSE SCHEDULE:

Students will be given 4 unit exams (and potentially one quiz), one comprehensive final exam, calculator activities and/or programs, and daily assignments. Below is a tentative schedule of material and assignments that will be covered during the course.

Monday	Tuesday	Wednesday	Thursday	Friday
Jan. 12 th	Jan. 13 th	Jan. 14 th Syllabus, 1.1, 1.2	Jan. 15 th	Jan. 16 th
Jan. 19 th NO CLASS— Martin Luther King, Jr. Day	Jan. 20 th	Jan. 21 st Sections 1.3 & 1.4	Jan. 22 nd	Jan. 23 rd
Jan. 26 th Sections 2.1 & 2.2	Jan. 27 th	Jan. 28 th Sections 2.3, 2.4, & 2.5	Jan. 29 th	Jan. 30 th
Feb. 2 nd Section 3.1	Feb. 3 rd	Feb. 4 th Section 3.2	Feb. 5 th	Feb. 6 th
Feb. 9 th Section 3.3	Feb. 10 th	Feb. 11 th Section 3.4, Review	Feb. 12 th	Feb. 13 th
Feb. 16 th Exam 1	Feb. 17 th	Feb. 18 th Sections 4.1 & 4.2	Feb. 19 th	Feb. 20 th
Feb. 23 rd Sections 4.3 & 4.4	Feb. 24 th	Feb. 25 th Sections 4.5 & 4.6	Feb. 26 th	Feb. 27 th
Mar. 2 nd Section 5.1	Mar. 3 rd	Mar. 4 th Section 5.2	Mar. 5 th	Mar. 6 th
Mar. 9 th Section 5.3, Review	Mar. 10 th	Mar. 11 th Exam 2	Mar. 12 th	Mar. 13 th
Mar. 16 th NO CLASS— JCCC Spring Break	Mar. 17 th Spring Break	Mar. 18 th NO CLASS— JCCC Spring Break	Mar. 19 th Spring Break	Mar. 20 th Spring Break
Mar. 23 rd Sections 6.1 & 6.2	Mar. 24 th	Mar. 25 th Sections 6.3 & 6.4	Mar. 26 th	Mar. 27 th
Mar. 30 th Sections 7.1 & 7.2	Mar. 31 st	Apr. 1 st Section 7.3/Catch-up Day	Apr. 2 nd	Apr. 3 rd
Apr. 6 th Sections 8.1 & 8.2	Apr. 7 th	Apr. 8 th Sections 8.3, 8.4, Review	Apr. 9 th	Apr. 10 th
Apr. 13 th Exam 3	Apr. 14 th	Apr. 15 th Sections 9.1 & 9.2	Apr. 16 th	Apr. 17 th
Apr. 20 th Sections 9.2 & 9.3	Apr. 21 st	Apr. 22 nd Sections 9.5 & 9.6	Apr. 23 rd	Apr. 24 th
Apr. 27 th Sections 12.1 & 12.2, Review	Apr. 28 th	Apr. 29 th Exam 4	Apr. 30 th	May 1 st

May 4 th Sections 14.1, 14.2, 14.3	May 5 th	May 6 th Sections 14.4, 15.1, Calculator Program Activity	May 7 th	May 8 th
May 11 th Final Review (optional)	May 12 th	May 13 th 7:00 p.m. Final Exam	May 14 th	May 15 th Grades posted

OTHER IMPORTANT DATES TO NOTE:

- Wednesday, January 21st: Last Day to Register or Change Schedule
- Wednesday, January 21st: Last Day to Drop with 100% Refund
- Wednesday, January 28th: Last Day to Drop with 80% Refund
- Wednesday, February 11th: Last Day to Drop without a “W” on Transcript
- Wednesday, April 15th: Last Day to Drop with “W” on Transcript and Request a Pass/Fail Grade

EVALUATION AND GRADING SCALE:

Course Grade will be broken down into three subcategories: Exams/Quizzes, Daily Work, and Projects/Activities. They will be weighted as follows and use the grading scale indicated:

Exams	50%	A	90-100%
Daily Work	30%	B	80-89%
Final Exam	+ 20%	C	70-79%
	100%	D	60-69%
		F	59 and below

Daily work will be scored on accuracy, not simply on completion. Scores will be recorded out of 10 points, where the student’s raw score will be rounded up to the next highest score. For instance, if a student scores the equivalent of 8.3 out of 10 on an assignment, the student’s score will be recorded as a 9. Also, if a student misses no more than three class sessions (10% of the semester’s sessions) and the student’s score on the Final Exam is better than their score on any of the unit exams, the score of the Final Exam will replace the lower test score.

Late work is accepted, but highly discouraged due to the pace of the coursework. One or two instances of late work are understandable, but beyond three instances, exceptions will not be made and could adversely affect a student’s grade by a letter grade or more.

The instructor is available outside of class time if additional help becomes a necessity. The most reliable way to reach him is by e-mail, by either of the addresses listed earlier in this document. Students should not feel as if the instructor is unavailable or impossible to find. If necessary, appointments can be made to work with the student’s extra-curricular schedule.

INFORMATION ON STUDENT ACCESS AND ACADEMIC DISHONESTY:

If you are a student with a disability, and if you will be requesting accommodations, it is your responsibility to contact Access Services. Access Services will recommend any appropriate accommodations to your professor and his/her director. The professor and director will identify for you which accommodations will be arranged.

JCCC provides a range of services to allow persons with disabilities to participate in educational programs and activities. If you desire support services, contact the office of Access Services for Students With Disabilities (913) 469-8500, ext. 3521 or TDD (913) 469-3885. The Access Services office is located in the Success Center on the second floor of the Student Center.

Student Code of Conduct and Academic Dishonesty Policies are addressed in the college handbook. It is your responsibility as a student to make sure you are familiar with these policies and consequences that arise as a result of violating policies.