



JOHNSON COUNTY COMMUNITY COLLEGE

Mathematics Division
Course Syllabus – College Now
Eudora High School
Math Department
Statistics
MATH 181-OP1
Spring 2010



INSTRUCTOR INFORMATION:

Name: Mr. Scott Keltner
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Course webpage: accessible through <http://www.eudoraschools.org/keltner>
Classroom: Eudora High School, room D-116
Planning Period: 2nd hour (9:10 to 10:01 on Regular Schedule)

COURSE INFORMATION:

Credit: 3 hours
Course ID: MATH 181-OP1, CRN: 13433
Course Type: Transfer
Prerequisites: Senior status according to accumulated credits as well as Algebra 2 and Precalculus at Eudora High School or equivalent transfer course credit

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. To successfully complete the pre-requisite(s) for this course, a student must earn at least a "C" or better in the pre-requisite course(s) or earn an appropriate score on a placement exam. If a student is found not to have successfully fulfilled the prerequisite(s) for this course, the student will be dropped from the course.
3. Student IEPs may call for a student to be enrolled in a level at or above this course. School administration and special education staff will be consulted in such instances for suggested enrollment and placement in course(s).
4. For part of the College Now course requirements, students may encounter questions about enrollment or obtaining JCCC course transcripts. The College Now website is located at <http://www.jccc.net/home/depts/1503> and includes information about enrollment, qualifications, and outcomes that you may find helpful.

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

Apr. 5 th Section 9.5	Apr. 6 th Section 9.6	Apr. 7 th Section 9.6	Apr. 8 th Section 12.1	Apr. 9 th Section 12.1
Apr. 12 th Section 12.2	Apr. 13 th Section 12.2	Apr. 14 th Review 4	Apr. 15 th Review 4	Apr. 16 th Exam 4
Apr. 19 th Exam 4	Apr. 20 th Section 14.1	Apr. 21 st Section 14.1	Apr. 22 nd Section 14.2	Apr. 23 rd Section 14.2
Apr. 26 th Section 14.3	Apr. 27 th Section 14.3	Apr. 28 th Section 14.4	Apr. 29 th Section 14.4	Apr. 30 th Section 15.1, Review 5
May 3 rd NO CLASS —Senior Trip	May 4 th Review 5	May 5 th “Quiz 5”	May 6 th Final Review	May 7 th Final Review
May 10 th Final Review	May 11 th Final Review	May 12 th Final Review	May 13 th Final Review	May 14 th Final Exam, Pt. 1
May 17 th Final Exam, Pt. 1 (Cont.)	May 18 th Final Exam, Pt. 2	May 19 th	May 20 th	May 21 st

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:

Eudora High School provides a range of services to allow persons with disabilities to participate in educational programs and activities. If you are in need of support services, contact the school office at (785) 542-4980.

Student Code of Conduct and Academic Dishonesty Policies are addressed in the school 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.