



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**ELEMENTARY STATISTICS LAB USING EXCEL
MTH 4424 1 Credit Hour**

Student Level:

This course is open to students on the college level in the freshman year.

Catalog Description:

MTH4424 - ELEMENTARY STATISTICS LAB USING EXCEL (1 hr)

Using Excel to construct frequency tables and histograms, compute and explore Measures of Tendency, sampling distributions, confidence intervals, and hypotheses testing. This course requires that the student have Microsoft Excel 97 or newer.

Prerequisite:

To be taken concurrent with MTH44223 Elementary Statistics or a minimum grade of C in MTH44223 Elementary Statistics

Controlling Purpose:

To introduce students to the fundamentals of analyzing statistical data from diverse areas of interest using Microsoft EXCEL.

Learner Outcomes:

Students who complete this course with a grade of A or B should be able to use Microsoft EXCEL to explore sets of statistical data and incorporate their findings in printed reports, papers or presentations.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.

- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

Chapter 1 INTRODUCTION TO STATISTICS							Section 1.5
Outcomes: Students will be introduced to EXCEL spread sheets, features of EXCEL, as well as the DDXL add-ins.							
A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						1.5	EXCEL: Know what a spreadsheet is, create a worksheet, save an Excel file, get help, undo work, open an Excel workbook, print an excel worksheet.

Chapter 2 DESCRIBING, EXPLORING, AND COMPARING DATA USING EXCEL							Section 2.2 – 2.7
Outcomes: The student will be able to use EXCEL for describing, exploring, and comparing data sets.							
A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						2.2	Summarize the data by constructing a frequency table or relative frequency table using bin numbers.
						2.3	Using EXCEL to construct a histogram, dot-plot, pie chart, and Pareto chart.
						2.4	Calculate measures of center by finding mean, median, mode, and midrange.
						2.5	Calculate measures of variation by finding standard deviation, variance, and range.
						2.6	Use EXCEL to calculate z scores, quartiles, deciles, or percentiles.
						2.7	Display the spread of data, the center of data, and the range of values by constructing a boxplot.

Chapter 3 PROBABILITY							Section 3.6 – 3.7
Outcomes: The student will use EXCEL features of counting principles related to factorial notation, permutations, and combinations.							
A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						3.6 3.7	The law of large numbers; random number generation; and calculation of factorials, combinations, and permutations.

Chapter 4 PROBABILITY DISTRIBUTIONS**Section 4.2, 4.3, 4.5**

Outcomes: The student will use EXCEL to compute the mean and standard deviation, and variance for a probability distribution table, as well as the Binomial and the Poisson probability distribution.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						4.2	Compute the mean, standard deviation and variance for a probability distribution using EXCEL
						4.3	Compute the mean and standard deviation of a binomial distribution using EXCEL
						4.5	Compute a Poisson probability distribution, which applies to occurrences of some event over a specific interval, and its probabilities using EXCEL.

Chapter 5 NORMAL PROBABILITY DISTRIBUTIONS**Section 5.1 – 5.7**

Outcomes: The student will use EXCEL to explore continuous probability distributions and focus on the most important category: normal distributions.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						5.2	Use the =normaldist(and =normsinv(feature of EXCEL
						5.3	Use of Standard Normal and Non Standard normal with EXCEL.
						5.4	Finding Percentiles, Deciles and Quartiles using EXCEL.
						5.5	Utilize the Central Limit Theorem using EXCEL.
						5.6	Utilize the continuity Corrections procedure to approximate the Binomial distribution using the normal distribution using EXCEL.
						5.7	Determine whether data have a Normal distribution. (Graphs and Plots)

Chapter 6 ESTIMATES AND SAMPLE SIZES**Section 6.1–6.6**

Outcomes: The student will use EXEL to explore confidence intervals with a focus on methods for finding estimates of population means, proportions, variances, and sample size

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						6.2	Use a list of data to construct and interpret a Confidence Interval
						6.2 6.3	Use EXCEL to estimate a Population Mean: Large and Small Samples and calculate the error.
						6.4	Determine required sample size
						6.5	Construct a confidence interval for the population proportion.
						6.5	Find the Point Estimate and E from a Confidence Interval.
						6.6	Use a Confidence Interval to describe, explore, and compare data.
						6.6	Estimate a Population Variance.
						6.6	Find the confidence interval (or interval estimate) for the Population Variance.

Chapter 7 HYPOTHESIS TESTING**Section 7.1–7.6**

Outcomes: The student will be able to perform the Z test, hypothesis test using different givens, and chi-squared.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						7.3 7.4	Use EXCEL to test a claim about a mean: large and small samples.
						7.4	Use EXCEL to test claims with confidence intervals.
						7.5	Use EXCEL to test claims with proportions.
						7.6	Use EXCEL to test a claim about a standard deviation or variance.

Chapter 8 INTERENCES FROM TWO SAMPLES**Section 8.1–8.5**

Outcomes: The student should be able to use EXCEL for hypothesis tests considering two samples drawn from two populations.(Mean, Variance or Standard Deviation)

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						8.2	Create list of Data (Keyboard and download)
						8.3 8.4	Determine confidence Interval Estimates. Perform Hypothesis Tests
						8.3 8.4	Draw inferences about two proportions. Perform Hypothesis Tests
						8.5	Compare Variation in two samples.

Chapter 9 CORRELATION AND REGRESSION**Section 9.1–9.6**

Outcomes: The student should use EXCEL to investigate relationships and correlations between two or more variables.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						9.2	Use scatter diagrams and linear correlation coefficient to decide whether there is a linear correlation between two variables.
						9.3	Use methods for finding the equation of the regression line.
						9.4	Use the concept of total variation with components of explained and unexplained variation.
						9.5	Determine procedure for obtaining a multiple regression equation.
						9.6	Explore the basic concepts of developing a mathematical model including nonlinear functions.

Projects Required:

None

Text Book:

Contact the Bookstore for current textbook.

Materials/Equipment needed:

Computer with EXCEL 97 or above and Internet access

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.