



# **ILLINOIS VALLEY COMMUNITY COLLEGE**

## **COURSE OUTLINE**

**DIVISION: Natural Sciences & Business**

**COURSE: ECN 2004 Business Statistics**

Date: Fall 2019

Credit Hours: 3

Prerequisite(s): MTH 0910

Delivery Method:  **Lecture**                      **3 Contact Hours (1 contact = 1 credit hour)**  
 **Seminar**                              **0 Contact Hours (1 contact = 1 credit hour)**  
 **Lab**                                        **0 Contact Hours (2-3 contact = 1 credit hour)**  
 **Clinical**                                **0 Contact Hours (3 contact = 1 credit hour)**  
 **Online**  
 **Blended**

Offered:  **Fall**     **Spring**     **Summer**

IAI Equivalent **Only for Transfer Courses** go to <http://www.itransfer.org>: M1 902 and BUS 901.

### **CATALOG DESCRIPTION:**

This course will provide an introduction to descriptive statistics and statistical inference as employed in business decision-making. Emphasis is on measures of central tendency and dispersion, frequency distribution, probability, hypothesis testing, estimation, statistical inference, simple linear regression, correlation and multiple linear regression.

## GENERAL EDUCATION GOALS ADDRESSED

*[See last page for Course Competency/Assessment Methods Matrix.]*

### Upon completion of the course, the student will be able:

*[Choose up to three goals that will be formally assessed in this course.]*

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciation for diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

### EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

*[Outcomes related to course specific goals. See last page for more information.]*

#### Upon completion of the course, the student will be able to:

1. Develop skills to identify the appropriate statistical technique for the analysis of data.
2. Learn how to interpret and present data for people without a statistics background.
3. Understand statistical techniques such as *t* tests, correlation and regression analyses.

### MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

*[For each of the goals selected above, indicate which outcomes align with the goal.]*

Goals	Outcomes
First Goal	
Apply analytical and problem solving skills to personal, social, and professional issues and situations.	Outcome 3. Understand statistical techniques such as F-tests, <i>t</i> -tests, correlation and both simple and multiple regression analyses.
Second Goal	
Communicate, both orally and in writing, to a variety of audiences.	Outcome 2. Learn how to interpret and present data for people without a statistics background.
Third Goal	
Understand and use technology effectively and to understand its impact on the individual and society.	Outcome 1. Develop skills to identify the appropriate statistical technique for the analysis of data.

## **COURSE TOPICS AND CONTENT REQUIREMENTS:**

Competency 1: Students will be able:

- 1.1 To show the difference between samples and populations
- 1.2 To convert raw data to useful information
- 1.3 To construct and use data arrays
- 1.4 To construct and use frequency distributions
- 1.5 To graph frequency distributions with histograms, polygons, and ogives
- 1.6 To use frequency distributions to make decisions

Competency 2: Students will be able:

- 2.1 To use summary statistics to describe collections of data
- 2.2 To use the mean, median, and mode to describe how data “ bunch up”
- 2.3 To use the range, variance, and standard deviation to describe how data “spread out”

Competency 3: Students will be able:

- 3.1 To examine the use of probability theory in decision making
- 3.2 To explain the different ways probabilities arise
- 3.3 To develop rules for calculating different kinds of probabilities
- 3.4 To use probabilities to account for new information by use of Bayes theorem

Competency 4: Students will be able:

- 4.1 To introduce the probability distributions most commonly used in decision making.
- 4.2 To use the concept of expected value to make decisions
- 4.3 To show which probability distribution to use and how to find its value
- 4.4 To understand the limitations of each of the probability distributions you use

Competency 5: Students will be able:

- 5.1 To take a sample from an entire population and use it to describe the population
- 5.2 To make sure samples accurately represent the population from which they came
- 5.3 To introduce the concepts of sampling distributions
- 5.4 To understand trade-offs between the cost and accuracy of taking larger sample sizes.
- 5.5 To introduce research design to gather the most information for the least cost

Competency 6: Students will be able:

- 6.1 To learn how to estimate certain characteristics of a population from samples
- 6.2 To learn the strengths and shortcomings of point estimates and interval estimates
- 6.3 To calculate how accurate our estimates really are
- 6.4 To use t distribution interval estimates when the normal distribution cannot be used
- 6.5 To calculate the sample size required for any desired level of precision in estimation

Competency 7: Students will be able:

- 7.1 To learn to use samples to decide whether a population possesses certain traits.
- 7.2 To determine how unlikely it is that an observed sample could have come from a hypothesized population
- 7.3 To understand the two types of errors possible when testing hypotheses
- 7.4 To learn when to use one-tailed test
- 7.5 To learn the five-step process for testing hypotheses
- 7.6 To understand how and when to use the normal and t distributions for testing hypotheses about population means and proportions

Competency 8: Students will be able:

- 8.1 To use samples from two populations to test hypotheses of the populations' relatedness
- 8.2 To conduct a Chi-square test
- 8.3 To distinguish between independent and dependent samples when comparing means
- 8.4 To learn how to test hypotheses that compare proportions of two populations
- 8.5 To understand how prob values can be used in testing hypotheses
- 8.6 To use outputs from computer statistical packages to produce for testing hypotheses

Competency 9: Students will be able:

- 9.1 To perform a one way analysis of variance test
- 9.2 To identify and understand positive and negative correlation
- 9.3 To understand the basics of linear regression

### **INSTRUCTIONAL METHODS:**

- Lecture
- Written assignments
- Class discussions
- Exams
- Videos
- Discussion of the Applications of Business Statistics in the Real World

### **INSTRUCTIONAL MATERIALS:**

- Textbook: Levin, Szabat & Stephan. (2016). *Business Statistics: A First Course*, 7<sup>th</sup> edition, Pearson Prentice Hall Publishing.
- Powerpoints
- Homework
- Exams
- Excel Computer Lab Exercises
- Videos

### **STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

- Regular class attendance.
- Active participation in class discussions
- Exams
- Completion of assigned work

A= 90-100

B= 80-89

C= 70-79

D= 60-69

F= 0-59

### **OTHER REFERENCES**

# Course Competency/Assessment Methods Matrix

(Dept/# Course Name)	Assessment Options																															
For each competency/outcome place an "X" below the method of assessment to be used.	<b>Assessment of Student Learning</b>	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment
		<b>Direct/ Indirect</b>	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D					
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.																																
Develop the skills required to identify the appropriate statistical technique for the analysis of data.		X						X	X																							X
Learn how to present and interpret data for people who don't have a statistics background.		X			X			X	X																							X
Understand statistical techniques such as F tests, t tests, correlation, simple and multiple regression.		X						X	X																							X