Effective Semester / Session: Fall 2020

Type of Action:

<table>
<tr><td>___</td><td>New</td></tr>
<tr><td>_X_</td><td>Modification</td></tr>
<tr><td>___</td><td>Move to Inactive (Stop Out)</td></tr>
<tr><td>___</td><td>Cancellation</td></tr>
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Course Alpha and Number: MA151

Course Title: Introduction to Statistics

Reason for initiating, revising, or canceling:
This course guide is being modified for SLO, course description, and changes as a part of a regular update cycle.

Eric Johnson   3-6-20

Proposer   Date

Velma C. De Leon Guerrero   3-6-20

Department Chair   Date

Adam Walsh   03.06.20

Language & Format Review Specialist   Date

Ajani Burrell   03.10.2020

Academic Council Chair   Date

Charlotte Cepeda   03/16/2020

Dean of Learning & Student Success   Date

1. Department
Science, Mathematics, Health, and Athletics

2. Purpose
This course is designed to introduce students to the basic principles of statistics and probability theory, guide them through a wide range of statistical applications, and give an introduction to the use of technology in effective processing and analysis of statistical information. The course also provides the necessary material needed for an understanding of statistical distributions, estimation, and linear regression. Ultimately, the course design intends to prepare students for success in further courses of applied statistics.

3. Description

A. Required/Recommended Textbook(s) and Related Materials
Required:

Mendenhall, William and Beaver, Robert J. and Beaver, Barbara M. (2020). Introduction to Probability and Statistics, 15th edition. Cengage. ISBN-13: 9781337554428

B. Contact Hours
1. **Lecture:** 3 per week / 45 per semester
2. **Lab:** 0
3. **Other:** None

C. Credits
1. **Number:** 3
2. **Type:** Regular Degree Credits

D. Catalogue Course Description
This course is designed to introduce students to the basic principles of descriptive and inferential statistics, along with the basic probability theory needed for an understanding of statistical distribution, estimation, and linear regression. The course provides students with the basic skills necessary to succeed in further courses of applied statistics, as well as an appreciation for the critical interpretation of statistical data, the range of statistic application, and an introduction to the effective processing and analysis of information through technology. Prerequisites: EN095, MA132. Offered Fall and Spring.

E. Degree or Certificate Requirements Met by Course
A "C" grade or better in this course satisfies a core course requirement in mathematics for an NMC associates-level degree program.

F. Course Activities and Design

Course activities include: lecture, discussions, homework assignments, tests, quizzes, and a comprehensive final exam.

4. Course Prerequisite(s); Concurrent Course Enrollment

Prerequisites: EN095, MA132
Concurrent Course Enrollment: None

Required English/Mathematics Proficiency Level(s):

English Placement Level: EN101
Mathematics Placement Level: MA161 or successful completion of MA132

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 3-credit course cost of textbook and graphing calculator.

Cost to NMC: Instructor's salary; a classroom; use of A-V equipment

Instructional resources needed for this course include: computers and software, TV, whiteboard and markers.

6. Method of Evaluation

Evaluation methods will include: quizzes, tests, homework assignments, and a comprehensive final exam. NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 The Nature of Probability and Statistics
 1.1 Descriptive and inferential statistics
 1.2 Variables and types of data
 1.3 Data collection and sampling techniques
 1.4 Observational and experimental studies
 1.5 Computers and calculators

2.0 Frequency Distributions and Graphs
 2.1 Organizing data
 2.2 Histograms, frequency polygons, and ogives
 2.3 Other types of graphs
 2.4 Paired data and scatter plots

3.0. Data Description
 3.1 Measures of central tendency
 3.2 Measures of variation
 3.3 Measures of position
 3.4. Exploratory data analysis

4.0 Counting Techniques
 4.1 Tree diagrams and the multiplication rule for counting
 4.2 Permutations and combinations

5.0 Probability
 5.1 Sample spaces and probability
 5.2 Addition rules for probability
 5.3 Multiplication rules and conditional probability

6.0 Probability Distributions
 6.1 Probability distributions
 6.2 Mean variance and expectation
 6.3 Binomial distribution

7.0 The Normal Distribution
 7.1 Properties of the normal distribution
 7.2 Standard normal distribution
 7.3 Applications of the normal distribution
 7.4. Central limit theorem

8. Instructional Goals

The course will introduce students to:

1.0 The Nature of Probability and Statistics;

2.0 Frequency Distribution and Graphs

3.0 Data Descriptions;

4.0 Counting Techniques;

5.0 Probability;

6.0 Probability Distribution; and

7.0. Normal Distribution.

9. Student Learning Outcomes
Upon successful completion of this course, students will be able to:

1.0 Demonstrate knowledge of statistical terms, the two branches of statistics, types of data, measurement levels, and sampling techniques;

2.0 Organize data using frequency distributions, histograms, frequency polygons, ogives, Pareto charts, time series graphs, and pie graphs;

3.0 Summarize data using the measures of central tendency, measures of variation, position of data, stem and leaf plots, box plots, and five number summaries;

4.0 Create tree diagrams, number of outcomes, permutation and combination rules;

5.0 Determine sample spaces using classical and empirical probability, addition rule, multiplication rule, and conditional probability;

6.0 Construct a probability distribution for a random variable; and

7.0 Perform operations to identify properties of normal distribution and probabilities by transformation into a standard normal variable.

10. Assessment Measures of Student Learning Outcomes
Assessment of student learning may include, but not be limited to, the following:

1.0 Quizzes;

2.0 Chapter Tests;

3.0 Homework Assignments; and

4.0 Final Comprehensive Examination