Course Outline Report

MATH 910 - Introduction to Probability and Statistics Support

Discipline: Mathematics

Department: Mathematics

Term Effective: Fall 2020

Requisites

Corequisite: MATH 110

Prerequisite: MATH 085 or MATH 095 or eligibility for MATH 910 as determined through the Crafton Hills College assessment process

Entrance Skill

A. Requisite Skills:
None

B. Recommended Skills:
None

Units and Hours

Semester Units: 1.000 - 2.000

Semester Hours:

Instructional Categories	Units	Contact Hours	Out of Class Hours
Lecture	1 - 2	16 - 36	32 - 72
Independent Study	0	0	0
Lab/Field	0	0	0
Activity	0	0	0
Total	1 - 2	16 - 36	32 - 72
Total Student Learning Hours	48 - 108		

Recommended Course Enrollment: 35

Need for the Course

With accelerated course placement, as promoted by the state legislature, there is a need to offer support to the student who has some skill deficiencies needed for success in Statistics. Research has shown that using prerequisite classes is not as effective as teaching the skills as they are needed in the statistics course content. Without this support the student with a weaker mathematics background has a low probability of success in the statistics course.

Goals for the Course

The goal for this course is to provide students with the prerequisite skills needed for successful completion of statistics courses at the time the skill is needed in the statistics course. This timely intervention provides students with the opportunity to be successful in the transfer level statistics course without several semesters of developmental mathematics courses.

Catalog Description

A review of the core prerequisite skills, competencies, and concepts needed in statistics. Intended for students who are concurrently enrolled in MATH 110, Introduction to Probability and Statistics. Topics include concepts from arithmetic, prealgebra, elementary and intermediate algebra, and descriptive statistics that are needed to understand the basics of college-level statistics. Concepts are taught through the context of descriptive data analysis. Additional emphasis is placed on solving and graphing linear equations and modeling with linear functions. Graded on a Pass/No Pass basis only.. Non-degree applicable.

Schedule Description

A review of the core prerequisite skills, competencies, and concepts needed in statistics. Intended for students who are concurrently enrolled in MATH 110, Introduction to Probability and Statistics. Topics include concepts from arithmetic, prealgebra, elementary and intermediate algebra, and descriptive statistics that are needed to understand the basics of college-level statistics. Concepts are taught through the context of descriptive data analysis. Additional emphasis is placed on solving and graphing linear equations and modeling with linear functions. Graded on a Pass/No Pass basis only. Non-degree applicable.

Student Learning Outcomes:

Upon satisfactory completion of the course, students will be able to:

1. Outcome Support: Apply the skills covered in 910 to improve their ability to successfully complete MATH 110.

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Identify the place-value structure of the base-ten number system and are able to represent and compare rational numbers (including negative rationals) in decimal form and their approximate location on a number line
2. Recognize, generate, and fluently use equivalent forms of fractions, decimals, and percentages

3. Set up two-way tables for bivariate categorical data and use appropriate marginal and conditional percents to investigate relationships and answer questions
4. Explain and apply the concept of variables as representations of quantities
5. Differentiate between independent and dependent variables
6. Recognize the difference between variables and parameters in general forms of linear models
7. Identify relationships that are proportional, define the constant of proportionality in the context of the problem, and use proportional reasoning to solve problems
8. Use the order of operations to evaluate statistical formulas by hand and with technology such as but not limited to summations, factorial, combinations, permutations, mean, standard deviation and correlation coefficient formula
9. Solve linear equations
10. Construct, use, and interpret mathematical models, specifically linear functions to represent and communicate relationships in quantitative data
11. Relate proportionality to linearity as well as the concept of the slope
12. Read statistical tables and locate identified values from statistical tables such as the t-table or z-scores table and/or successfully input values into statistical software and interpret output as an alternative to common tables such as the t-table or z-scores table
13. Read, analyze and interpret contextualized problems
14. Graph a line and find the equation representing the line given two relevant data points
15. Create a scatter plot given several data points
16. Demonstrate an understanding of and be able to interpret confidence intervals
17. Demonstrate an understanding of center as used in statistics
18. Consistently apply effective learning strategies for success in college. Students will demonstrate that they can apply effective learning strategies if they: a. attend class regularly; b. turn in assignments on time; c. work productively with peers on group assignments; d. seek help from peers, teacher, and other resources when necessary; e. set up and maintain their math notebook; f. use rubric criteria to assess performance on assignments and make improvements; and g. meet with a counselor to develop an educational plan.
19. Apply affective domain theories to improve their success in this and other college courses

Course Content

Lecture Outline

   A. Identification of place values
       1. Comparison of rational numbers in decimal form
       2. Approximate the location of rational numbers on a number line
   B. Equivalent forms of fractions, decimals, and percentages
   C. Set up of 2 way tables for bivariate categorical data
       1. Use of marginal and conditional percents to investigate relationships
       2. How to answer questions regarding the data
   D. Concept of variables
       1. Use of variable to represent various quantities
       2. Independent and dependent variables and the differences between them
   E. Differences between variables and parameters in general forms of linear models
   F. Proportional relationships

      1. Identification of proportional relationships

      2. Definition of the constant of proportionality in contextualized problems

      3. Use of proportional reasoning to solve contextualized problems

G. Order of operations for the evaluation of statistical formulas by hand and with technology

      1. Summations

      2. Factorials

      3. Combinations

      4. Permutations

      5. Mean

      6. Standard deviation

      7. Correlation coefficient formula

H. Solving linear equations

I. Mathematical linear function models to represent and communicate relationships of quantative data

      1. Construction of

      2. Use of

      3. Interpretation of

J. Relationship of proportionality to linearity including the concept of slope

K. Reading statistical tables and locating identified values from statistical tables and/or successful input of values into satistical software and interpret output as an alternative to common tables such as

      1. t-table

      2. z-scores table

L. Reading, analysis of and interpretation of contextualized problems

M. Graphing a line given two relevent data points

N. Finding the equation representing the line formed by two given data points

O. Creation of a scatter plot given several data points

P. Definition and interpretation of confidence interval

Q. Concept of center as used in statistics

R. Effective learning strategies covering but not limited to the importance of

      1. Attending class

      2. Turning in homework on time

      3. Working with peers, instructor, and other resources

      4. Maintaining a mathematics notebook

      5. Self-assessment of assignments

      6. Development of a student educational plan

S. Affective domain theories such as but not limited to

      1. Motivation

      2. Growth mind set

      3. Grit

      4. Persisting when struggling on a problem

      5. Working with stress

      6. Learning from mistakes

      7. Power of introverts

Representative Texts and Instructional Materials

Other: This course will use handouts and activities created by the instructors and the department faculty. The text used for MATH 110 may also be used.

Methods of Instruction

- **Class Activities**

- **Class Discussions**

- **Collaborative Group Work**

- **Computer-aided Instruction**

- **Demonstration**

- **Guest Speakers**

- **Lecture**

- **Other (Specify)**

  A. The intention of the corequisite course is to be taught in a just in time approach to supplement the material of MATH 110 and should be taught accordingly.

Emergency Remote Instruction Yes

In emergency circumstances that require campus closure, remote instruction may be incorporated. Courses offered remotely will achieve or adapt stated learning outcomes for the remote environment. Instruction will maintain regular effective contact through conferencing and LMS applications. Instructional materials will be adapted to meet ADA compliance. Instructors will be supported through available campus resources including Alternative Media and Assistive Technology Specialist, DSPS Office, PD Lead, DE Lead, and other available resources to help ensure that instructional materials are accessible to persons with disabilities.

Assignments and Methods of Evaluation

Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, or skills demonstration.

5%-10% Group project(s), class activities, homework exercises, and exam questions which measure students' ability to explore and represent data.

20%-30% Projects, class activities, homework assignments, and exams (including a comprehensive final exam) which measure students' ability to exhibit numerical and algebraic reasoning and computational skills, and model quantitative data using linear models.

60%-70% In-class activities, homework, math notebook, and data analysis projects which demonstrate students' ability to apply effective learning strategies.

Last Revision
2019-04-08

Board Approval

2019-05-16