

## MERRITT COLLEGE COURSE OUTLINE

<b>COLLEGE:</b>		<b>STATE APPROVAL DATE:</b>	02/03/2019
<b>ORIGINATOR:</b>	Daniel Lawson	<b>STATE CONTROL NUMBER:</b>	CCC00060 1770
		<b>BOARD OF TRUSTEES APPROVAL DATE:</b>	01/08/2019
		<b>CURRICULUM COMMITTEE APPROVAL DATE:</b>	09/13/2018
		<b>CURRENT EFFECTIVE DATE:</b>	08/01/2019

### DIVISION/DEPARTMENT:

#### 1. REQUESTED CREDIT CLASSIFICATION:

Credit - Degree Applicable  
Course is not a basic skills course.  
Stand-alone

#### 2. DEPT/COURSE NO:

MATH 213

#### 3. COURSE TITLE:

Support for Statistics

#### 4. COURSE: MC New Course

**TOP NO.** 1701.00

#### 5. UNITS: 2.000

**HRS/WK LEC: 2.00 Total: 35.00**

**HRS/WK LAB:**

#### 6. NO. OF TIMES OFFERED AS SELETED TOPIC: AVERAGE ENROLLMENT:

#### 7. JUSTIFICATION FOR COURSE:

As the number of levels of pre-transfer-level mathematics an entering community college student must complete increases, the likelihood that the student will ever successfully complete a transfer-level mathematics course decreases according to large research studies conducted both inside and outside of California. By offering Support for Statistics the mathematics department aims to provide students with co-requisite course with transfer-level Math 13, Introduction to Statistics. Contextualizing the curriculum and focusing instruction on the skills, methods and ways of thinking needed for understanding statistical applications is expected to ignite student interest, increase retention and success, and prepare students to succeed in their concurrently enrolled Math 13. Not for science, technology, engineering, mathematics, nursing or business majors.

#### 8. COURSE/CATALOG DESCRIPTION

Competencies and concepts needed in statistics: Arithmetic, pre-algebra, elementary and intermediate algebra, and descriptive statistics; descriptive data analysis, solving and graphing linear equations, and modeling with linear functions. Intended for students who are concurrently enrolled in MATH 13.

#### 9. OTHER CATALOG INFORMATION

- a. Modular: No If yes, how many modules:
- b. Open entry/open exit: No
- c. Grading Policy: Pass/No Pass
- d. Eligible for credit by Exam: No
- e. Repeatable according to state guidelines: No
- f. Required for degree/certificate (specify):
- g. Meets GE/Transfer requirements (specify):
- h. C-ID Number: Expiration Date:

- i. Are there prerequisites/corequisites/recommended preparation for this course? Yes

#### 10. LIST STUDENT PERFORMANCE OBJECTIVES (EXIT SKILLS): (Objectives must define the exit skills required of students and include criteria identified in Items 12, 14, and 15 - critical thinking, essay writing,

problem solving, written/verbal communications, computational skills, working with others, workplace needs, SCANS competencies, all aspects of the industry, etc.)(See SCANS/All Aspects of Industry Worksheet.)

Students will be able to:

1. Problem solving and study skills
2. Fractions, decimals, and percents - Use fractions, decimals, and percents to interpret bar charts and pie charts. Recognize and generate equivalent forms of fractions, decimals, and percents. Evaluate expressions using order of operations. Graph fractions, decimals, and signed numbers on a number line. Compare and interpret fractions, decimals, percents, signed numbers as they relate to the formulas for mean, variance, standard deviation, median, quartiles, and percentiles. Identify when data has a constant percent change. Compare relative and absolute differences.
3. Use contingency tables to: identify fractions and percents and describe part of a whole (marginal distributions), identify fractions and percents that describe the impact of one quantity on another (conditional distributions)
4. Measures of Center: Calculate and interpret measures of center and associated measures of spread (mean, variance, standard deviation, median, quartiles, percentiles). Analyze algebraic structures and forms to understand measures of center and associated measures of spread.
5. Graphing: Construct and read bar charts and pie charts. Graph the set of solutions to an equation. Create graphs of univariate distributions of quantitative data: histograms, stem-and-leaf plots, and boxplots. Create graphs and models for bivariate distributions of quantitative variables. Interpret scatterplots using linear scales.
6. Solve equations. Solve proportions. Solve linear equations.
7. Analyze algebraic structures not typically taught in pre-algebra nor intermediate algebra: signed distance from the mean, average of squared distances from the mean, geometric interpretations relating why standard deviation is roughly an average distance from the mean and why positively associated data in a scatterplot gives positive correlation.
8. Linear modeling: Use least squares regression to model linear relationships. Calculate and interpret the correlation coefficient  $r$  and  $r^2$  as measures of strength and spread in linear regression. Use linear functions to model data.

**11A. COURSE CONTENT:** List major topics to be covered. This section must be more than listing chapter headings from a textbook. Outline the course content, including essential topics, major subdivisions, and supporting details. It should include enough information so that a faculty member from any institution will have a clear understanding of the material taught in the course and the approximate length of time devoted to each. There should be congruence among the catalog description, lecture and/or lab content, student performance objectives, and the student learning outcomes. List percent of time spent on each topic; ensure percentages total 100%.

#### LECTURE CONTENT:

1. Topics from Pre-Algebra and Beginning Algebra 25%
  - a. Order of operations
  - b. Performing arithmetic operations on signed numbers
  - c. Graphing fractions, decimals, and signed numbers on a number line
  - d. Comparing fractions with the same and with different denominators
  - e. Comparing fractions, decimals, and percentages
  - f. Identifying fractions and percentages that describe part of a whole (marginal distributions)
  - g. Identifying fractions and percentages that describe the impact of one quantity on another (conditional distributions)
  - h. Relative versus absolute difference
  - i. Graphing in the Cartesian coordinate system
  - j. A graph as the set of solutions to an equation
  - k. Proportions and linearity
2. Topics from Intermediate Algebra 25%
  - a. Evaluating expressions
  - b. Scatterplots
  - c. Solving linear
  - d. Linear functions, constant rate of change, graphing, interpreting slope and y-intercept in context
3. Graphs of distributions of categorical data: bar charts and pie charts 10%
4. Contingency tables: marginal and conditional distributions 5%
5. Measures of center and associated measures of spread: mean, variance, standard deviation median, quartiles, percentiles 10%
6. Graphs of univariate distributions of quantitative data: histograms and boxplots 10%

7. Topics related to developing effective learning skills: 15%

- a. Study skills: organization and time management, test preparation and test-taking skills
- b. Self-assessment: using performance criteria to judge and improve one's own work, analyzing and correcting errors on one's test
- c. Use of resources: strategies identifying, utilizing, and evaluating the effectiveness of resources in improving one's own learning, e.g., peer study groups, computer resources, lab resources, tutoring resources

**11B. LAB CONTENT:**

N/A

**12. METHODS OF INSTRUCTION** (List methods used to present course content.)

1. Activity
2. Lecture
3. Lab
4. Observation and Demonstration
5. Projects
6. Multimedia Content

## Other Methods:

Instructor led lecture and student discovery introducing the major concepts, theory, and applications in the language of statistics and analysis. Interactive class discussions on worksheets, including question and answer sections reviewing case studies as presented in text books and lecture. Projects to apply content to real world contexts, solidifying knowledge.

**13. ASSIGNMENTS:** 0.00 hours/week (List all assignments, including library assignments. Requires two (2) hours of independent work outside of class for each unit/weekly lecture hour. Outside assignments are not required for lab-only courses, although they can be given.)

## Out-of-class Assignments:

Problem sets including problems equivalent to those covered in lectures and original problems which require the synthesizing of various concepts. Written homework to distinguish between specifics in questions, and application of multiple tables and formulas to ensure individual understanding.

ASSIGNMENTS ARE: (See definition of college level):  
NOT primarily college level

**14. STUDENT ASSESSMENT:** (Grades are based on):  
COMPUTATION SKILLS  
SKILL DEMONSTRATION  
MULTIPLE CHOICE

## Why "ESSAY" is not checked:

Mathematics support course; not writing-applicable.

**15. TEXTS, READINGS, AND MATERIALS**

## A. Textbooks:

Bittinger, Ellenbogen, Johnson. *Elementary and Intermediate Algebra: Concepts and Applications*. 7th Pearson, 2018.

Charles P. McKeague; Kate Duffy Pawlik. *Prealgebra*. 7th xyztextbooks, 2014.

\*Date is required: Transfer institutions require current publication date(s) within 5 years of outline addition/update.

## B. Additional Resources:

## Library/LRC Materials and Services:

The instructor, in consultation with a librarian, has reviewed the materials and services of the College Library/LRC in the subject areas related to the proposed new course

Are print materials adequate? No

Are nonprint materials adequate? No

Are electronic/online resources available? No

Are services adequate? No

Specific materials and/or services needed have been identified and discussed. Librarian comments:

C. Readings listed in A and B above are: (See definition of college level):

NOT primarily college level

**16. DESIGNATE OCCUPATIONAL CODE:**

E - Non-Occupational

**17. LEVEL BELOW TRANSFER:**

A - 1 Level Below Transfer

**18. CALIFORNIA CLASSIFICATION CODE:**

Y - Credit Course

**19. NON CREDIT COURSE CATEGORY:**

Y - Not Applicable

**20. FUNDING AGENCY CATEGORY:**

Not Applicable - Not Applicable

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**SUPPLEMENTAL PAGE**

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Use only if additional space is needed. (Type the item number which is to be continued, followed by "continued."

Show the page number in the blank at the bottom of the page. If the item being continued is on page 2 of the outline, the first supplemental page will be "2a." If additional supplemental pages are required for page 2, they are to be numbered as 2b, 2c, etc.)

1a. Prerequisites/Corequisites/Recommended Preparation:

**COREQUISITE:**

- MATH 013: Introduction to Statistics

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**STUDENT LEARNING OUTCOMES**

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1. **Outcome:** Create inferences about populations based on data obtained from samples.

*This outcome maps to the following Institution Outcomes:*

- Critical Thinking - Think critically using appropriate methods of reasoning to evaluate ideas and identify and investigate problems and to develop creative and practical solutions to issues that arise in workplaces, institutions, and local and global communities.
- Quantitative Reasoning - Apply college-level mathematical reasoning to analyze and explain real world issues and to interpret and construct graphs, charts, and tables.

**Assessment:** Questions on Quizzes/Tests/Homework from Math 13 will be used to assess how well students have successfully met this outcome.

2. **Outcome:** For given sampling methods, decide whether or not a particular method of inference (Hypothesis Test or Confidence Interval) is appropriate and justify the response.

*This outcome maps to the following Institution Outcomes:*

- Critical Thinking - Think critically using appropriate methods of reasoning to evaluate ideas and identify and investigate problems and to develop creative and practical solutions to issues that arise in workplaces, institutions, and local and global communities.
- Quantitative Reasoning - Apply college-level mathematical reasoning to analyze and explain real world issues and to interpret and construct graphs, charts, and tables.

**Assessment:** Questions on Quizzes/Tests/Homework from Math 13 will be used to assess how well

students have successfully met this outcome.

3. **Outcome:** Analyze the relationship between 2 variables, using the tools of linear regression.

*This outcome maps to the following Institution Outcomes:*

- Quantitive Reasoning - Apply college-level mathematical reasoning to analyze and explain real world issues and to interpret and construct graphs, charts, and tables.
- Critical Thinking - Think critically using appropriate methods of reasoning to evaluate ideas and identify and investigate problems and to develop creative and practical solutions to issues that arise in workplaces, institutions, and local and global communities.

**Assessment:** Questions on Quizzes/Tests/Homework from Math 13 will be used to assess how well students have successfully met this outcome.

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