

## 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 1771
		<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 215

#### 3. COURSE TITLE:

Support for Pre-Calculus

#### 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 Pre-Calculus, the mathematics department aims to provide students with co-requisite course with transfer-level Math 1, Pre-Calculus. Contextualizing the curriculum and focusing instruction on the skills, methods and ways of thinking needed for understanding pre-calculus concepts is expected to ignite student interest, increase retention and success, and prepare students to succeed in their concurrently enrolled Math 1. For science, technology, engineering, mathematics, or business majors.

#### 8. COURSE/CATALOG DESCRIPTION

Review of the core prerequisite skills, competencies, and concepts needed in pre-calculus: Factoring, operations on rational and radical expressions, absolute value equations and inequalities, exponential and logarithmic expressions and equations, conic sections, functions including composition and inverses, an in-depth focus on quadratic functions, and a review of topics from geometry. Intended for students majoring in business, science, technology, engineering, and mathematics and concurrently enrolled in MATH 1. This course is appropriate for students who are confident in their graphing and beginning algebra skills.

#### 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. Simplify algebraic expressions.
2. Solve equations and use them to solve practical problems - first degree equations and inequalities - quadratic equations and inequalities - rational and radical equations - exponential and logarithmic equations

3. Solve systems of equations.
4. Solve and interpret the solutions of application problems
5. Work with linear, polynomial, exponential, and logarithmic functions.
6. Apply formulas to evaluate perimeter, area, surface area and volume of geometric objects

**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:**

A "just-in-time" and as needed approach to: 100%

1. Review of Real numbers – properties and operations
2. Functions
  - a. Domain and Range
  - b. Algebra and Composition of Functions
  - c. Inverse Functions
3. Graphing of linear, absolute value, and quadratic functions
4. Creating equations from the graphs of linear and quadratic functions
5. Using graphic, numeric and analytic methods to solve linear, quadratic, radical, and rational equations
6. Inequalities
  - a. Solving linear Inequalities
  - b. Polynomial and Rational Inequalities
7. Solving application problems
8. Quadratic Equations
  - a. Solve by Factoring
  - b. Solve by Square Root Property and Completing the Square
  - c. Solve by Quadratic Formula
9. Linear systems of equations
10. Radicals and Rational Exponents
11. Complex Numbers
12. Exponential and logarithmic functions, their graphs, their inverse relationship and application
13. Geometric Formulas
  - a. Perimeter
  - b. Area
  - c. Surface Area
  - d. Volume
14. Topics related to developing effective learning skills
  - a. Study skills: organization and time management, test preparation and test-taking skills
  - b. Self-assessment: using performance criteria to judge and improve ones own work, analyzing and correcting ones errors on ones tests.
  - c. Use of resources: strategies identifying, utilizing, and evaluating the effectiveness of resources in improving ones learning: e.g. peer study-groups, computer resources, lab resources, and tutoring resources

**11B. LAB CONTENT:**

nnnnn

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

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

**Other Methods:**

Instructor led lecture and student discovery introducing the major concepts, theory, and applications in precalculus and analysis. Interactive class discussions on worksheets, including question and answer sections reviewing problems 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:

Michael Sullivan. *Precalculus: Concepts through functions, A right triangle approach to trigonometry.*  
3rd Pearson, 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? Yes

Are nonprint materials adequate? Yes

Are electronic/online resources available? Yes

Are services adequate? Yes

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 001: Pre-Calculus

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**STUDENT LEARNING OUTCOMES**

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1. **Outcome:** Develop problem solving abilities: Translate words into math language, and construct an abstract model that describes the problem. (Proof and Deductive Reasoning skills)

*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:** Test, Quiz and/or In class or Homework problems that target this SLO. Could also be linked to the course it supports (the corresponding Math 1 course)

2. **Outcome:** Create, write and manipulate complex algebraic expressions and general functions, and solve algebraic and transcendental equations. (Compute, simplify and solve.)

*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.

**Assessment:** The assessment will likely focus on the solving of such equations. It will be assessed using Quiz, Test or homework. Could be done in a group setting, if desired. This SLO could also be assessed in the corresponding Math 1 course, if desired.

3. **Outcome:** Analyze information, and create a graph that is correctly titled and labeled, appropriately designed, and accurately emphasizes the most important/interesting characteristics of the graph.

*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.

**Assessment:** The assessment will likely focus on the solving of such equations. It will be assessed using Quiz, Test or homework. Could be done in a group setting, if desired. This SLO could also be assessed in the corresponding Math 1 course, if desired.

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