

Mt. San Jacinto College
Integrated Course Outline of Record

Form B

Submitted by:	Jorge Valdez	Date:	12/17/2020
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Department	Subject	Course Number	Title
Mathematics	Mathematics MATH	082	Support for College Algebra (formerly Support for College Algebra or Precalculus)

Units/Hours

Each lecture unit requires 1 hour per week of class time, and 2 hours per week of study outside of class.
Each laboratory unit requires 3 hours per week of class time.
Each activity unit requires 2 hours per week of class time and 1 hour per week of study outside of class.

Lab Units	Total Units
1.00	1.00
Lab Contact Hours	Total Contact Hours
48.00 - 54.00	48.00 - 54.00
Lab Homework Hours	
0	

Stand Alone:

Stand Alone

AA/AS Degree General Ed Breadth Area(s):

-none-

General Education Justification:

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Maximum Enrollment:	40
Maximum Enrollment Justification:	Justification:
Grading Method:	P/NP Only
TOP code:	1702.00

Can be Taken	1	time(s) for credit (max 4)
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- Visual or Performing Arts course that is required to meet major requirements for UC/CSU
- Intercollegiate athletics course
- Academic/vocational competition course

Catalog Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course).
(75 words or less in gray box below).

This course covers the topics necessary to be successful in College Algebra. It covers core prerequisite skills, competencies, and concepts from Intermediate Algebra. Topics will include equations and inequalities, linear and non-linear functions, factoring polynomials, complex numbers, as well as graphing functions and conic sections.

Schedule Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course).
(25 words or less in gray box below).

This course must be taken concurrently with and covers prerequisite material necessary to be successful in Math 105.

Need for the course:

We need to develop this course to be in compliance with California bill AB705, which encourages some college level classes be offered with a concurrent support class. This course will provide unprepared students with the necessary material to be successful in a college level class. This course will be offered linked for a few sections of College Algebra but not for all. Students that sign up for linked sections will have to take both classes. The AB705 implementation guidelines have 3 levels that depend on a student’s overall GPA from high school. The higher tier does not have this new course as a recommendation. The middle tier has the course as a recommendation. The bottom tier will have the course as a strong recommendation. Students will not be required to take the course. All students can sign up for a College Algebra class with or without this course. This course will be taught by the same instructor teaching the college level course that it is linked with.

Prerequisite(s):

Prerequisites go through a separate approval process. See Forms E1-E6 for details.
(For further clarification, contact the Prerequisite Subcommittee)

-none-

Corequisite(s):

Corequisites go through a separate approval process. See Forms E1-E6 for details.

- MATH 105

Recommend Preparation:

Recommended Preparation goes through a separate approval process. See Forms E1-E6 for details.

-none-

Other Enrollment Criteria:

-none-

Learning Objectives:

(please number each objective and express in behavioral terms)
Upon the completion of the course the student will be able to do the following:

- Solve quadratic inequalities.

2. Solve quadratic, rational, radical, exponential and logarithmic equations.
3. Determine if a given graph represents a function, and state the domain and range.
4. Construct the graph of exponential functions and conic sections.
5. Choose the right procedure to factor polynomials of higher degrees.
6. Produce the simplified form of a negative radicand utilizing a factor of i .
7. Formulate the logarithmic equivalent of an exponential function.
8. Consistently apply affective learning strategies for success in college.

Course Content:

(please number the outline of main topics and subtopics)

This is a Lab Only course.

Lab Content:

(please number the outline of main topics and subtopics)

1. Integer Exponents
 1. Definitions/terminology/theorems
 2. Laws
 3. Evaluation
 4. Simplification
2. Absolute Value, Exponential and Radical Expressions
 1. Definitions/terminology/theorems
 2. Evaluation and simplification of absolute value, exponential and radical expressions
 3. Translation of expressions with rational exponents to their radical equivalents and vice versa
 4. Solutions to radical equations
3. Polynomials
 1. Definitions/terminology/theorems
 2. Multiply and perform Long Division
 3. Solve polynomial equations
4. Rational Expressions, Functions and Equations
 1. Definitions/terminology/theorems
 2. Arithmetic of rational expressions
 3. Solve rational equations
 4. Graph utilizing horizontal and vertical asymptotes
5. Quadratic Equations and Inequalities
 1. Definitions/terminology/theorems
 2. Solve by completing the square and using the quadratic formula
 3. Applications
6. Complex Numbers
 1. Definitions/terminology/theorems
 2. Addition, subtraction, multiplication and division of complex numbers
7. Functions
 1. Definitions/terminology/theorems
 2. Dependent and independent variables
 3. Transformation of Graphs
 4. Domain and range
 5. Vertical line test
 6. Function notation
 7. Evaluation of functions
8. Exponential and Logarithmic Functions
 1. Definitions/terminology/theorems
 2. The number e

3. Graphs of exponential functions

4. Convert between exponential and logarithmic form
9. Conic Sections

1. Definitions/terminology/theorems

2. Equations and graphs of circles

3. Equations and graphs of parabolas

4. Equations and graphs of ellipses centered at the origin

5. Equations and graphs of hyperbolas centered at the origin
10. Topics related to developing affective learning skillsStudy skills:

1. organization and time management, test preparation and test-taking skills

2. Self-assessment: using performance criteria to judge and improve one's own work, analyzing and correcting errors on one's test

3. 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

Methods of Instruction:

Methods of instruction may include, but are not limited to the following:

- **Method:** Lecture

Integration: Lecture will be used to illustrate definitions, concepts and example problems to promote comprehension of how to produce solutions to rational applications.
- **Method:** Discussion

Integration: Instructors will guide the class in discussion to reinforce students comprehension of how to produce solutions to quadratic, rational, absolute value and radical equations.
- **Method:** Activity

Integration: Students will work on activities in groups of 3 or 4 people to reinforce comprehension of logarithmic expression and will work on formulating the logarithmic equivalent of an exponential function.
- **Method:** Mediated Learning

Integration: During class, students will be able to use technology to construct the graph of functions in two variables.
- **Method:** In-class Exercises

Integration: Students will be required to determine domain of a function, the value of the function for a given value of the independent variable, and the solution of a system of equation in two and three variables.

Methods of Evaluation:

A student's grade shall be determined by the instructor using multiple measures of performance related to the course objectives. Methods of evaluation may include but are not limited to the following:

- **Method:** Class Participation

Integration: Class participation will be required during class to explain the process of solving quadratic, rational, and absolute value equations and inequalities. The student will be graded on the correctness of the statement given.
- **Method:** Projects

Integration: A project presentation can be given in class by the student on how to factor polynomials of higher degrees or on how to simplify complex fractions. It can be evaluated on correctness and delivery.
- **Method:** Quizzes

Integration: Quizzes can be given to evaluate how well students can determine if a graph represents a function along with giving the domain and range for it.
- **Method:** Exams/Tests

Integration: Exams can be given to determine the student's ability to use graphic, numeric, and algebraic techniques; simplify algebraic expressions; formulate, analyze and solve algebraic equations, inequalities, and systems of equations; construct graphs of functions and conic sections. A final comprehensive exam may be given at the instructor's discretion.

Examples of Assignments:

Students will be expected to understand and critique college level texts or the equivalent. Reading and writing, as well as out of class assignments are required. These assignments may include but are not limited to the following:

To complete the following assignments, read the appropriate section in the textbook, review your notes and then:

Problem 1. Solve and Graph the inequalities.

$$2x^2 + 3x \geq 0$$

$$|7 - x| < 5$$

$$x^2 + 3x - 4 > 0$$

Problem 2. Solve these exponential and logarithmic equations.

$$3^{(x+1)} = 9$$

$$\log(x - 3) = 1$$

Problem 3. Determine if a given graph represents a function, and state the domain and range.

Problem 4. Graph.

$$y = 2x^2 - 8x + 9.$$

$$y = e^{x+2}$$

$$\text{Sketch the graph of the ellipse: } x^2 + 4y^2 = 16$$

$$\text{Rewrite the equation } x^2 + y^2 + 4x - 6y - 23 = 0 \text{ in standard form and sketch the graph of the circle.}$$

Problem 5. Factor Completely.

$$5(x - y)^2 + 4(x - y) - 1$$

$$8 + 27w^3$$

$$x^2 + 4x + 4 - y^2$$

$$10x^4 + x^2 - 3$$

Problem 6. Solve this system of equations.

$$x - 2y + z = -8$$

$$2x + 3y - z = 7$$

$$x - y + 2z = -9$$

Problem 7. Simplify these expressions over the complex number.

square root (-48)
(2 - 3i) - (7 + 4i)
(5 -4i)(3 + 8i)
(2-i) / (4 + 3i)

Problem 8. Use the definition of the log function to rewrite each expression.

$2^x = 7$
 $\log x = 3$

Problem 9. Find all the zeros of the given Polynomial. Show all your work.

$P(x) = 3x^2 - 5x + 7$
 $P(x) = x^3 - 4x^2 - 5x$

Problem 10. Evaluate the polynomial in function notation, $R(t) = 5(t - 3)^2 + 1$, for the given value.

Find $R(-2)$
 $R(0)$
 $R(4z + 7)$

Textbooks:

- Gustafson, D., Hughes, J. (2017). *College Algebra* Cengage Learning. ISBN: 978-1-305-65223-1
- Sullivan & Sullivan (2019). *College Algebra: Concepts Through Functions 4th* Pearson. ISBN: 13: 9780134775784

Other Resources:

Minimum Qualification

- Mathematics (Masters Required)