

# MATH M911S: SUPPORT FOR COLLEGE ALGEBRA FOR LIBERAL ARTS

**Originator**

pabramoff

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**College**

Moorpark College

**Attach Support Documentation (as needed)**

MATH M911S\_state approval letter\_CCC000621760.pdf

**Discipline (CB01A)**

MATH - Mathematics

**Course Number (CB01B)**

M911S

**Course Title (CB02)**

Support for College Algebra for Liberal Arts

**Banner/Short Title**

Support - Col Alg for Lib Arts

**Credit Type**

Noncredit

**Start Term**

Fall 2023

**Catalog Course Description**

Reviews topics necessary for success in College Algebra for Liberal Arts, including linear equations and inequalities, graphing, factoring, and rational expressions. Covers systems of linear equations, rational functions, rational exponents and radicals, complex numbers, quadratic equations, graphs of parabolas, functions, composition and inverse functions, exponential and logarithmic functions.

**Additional Catalog Notes**

This course requires concurrent enrollment in MATH M11.

**Taxonomy of Programs (TOP) Code (CB03)**

1702.00 - Mathematics Skills

**Course Credit Status (CB04)**

N (Noncredit)

**Course Transfer Status (CB05) (select one only)**

C (Not transferable)

**Course Basic Skills Status (CB08)**

B - The Course is a Basic Skills Course

**SAM Priority Code (CB09)**

E - Non-Occupational

**Course Cooperative Work Experience Education Status (CB10)**

N - Is Not Part of a Cooperative Work Experience Education Program

**Course Classification Status (CB11)**

L - Non-Enhanced Funding

**Educational Assistance Class Instruction (Approved Special Class) (CB13)**

N - The Course is Not an Approved Special Class

**Course Prior to Transfer Level (CB21)**

Y - Not Applicable

**Course Noncredit Category (CB22)**

C - Elementary and Secondary Basic Skills

**Funding Agency Category (CB23)**

Y - Not Applicable (Funding Not Used)

**Course Program Status (CB24)**

1 - Program Applicable

**General Education Status (CB25)**

Y - Not Applicable

**Support Course Status (CB26)**

S - Course is a support course

**Special Characteristics Code Descriptor**

LA - Learning Assistance (a form of supplemental instruction)

**Field trips**

Will not be required

**Grading method**

(P) Pass/No Pass Grading

**Does this course require an instructional materials fee?**

No

**Repeatable for Credit**

Yes

**Number of times a student may enroll in this course**

Unlimited

**Maximum units a student may earn in this course**

0

**Units and Hours**

**Carnegie Unit Override**

No

**Total in-Class (full semester or term)**

**Total Minimum Contact/In-Class Hours (for full semester or term; not weekly)**

35

**Total Maximum Contact/In-Class Hours (for full semester or term; not weekly)**

35

## Total Student Learning

### Total Student Learning

#### Total Minimum Student Learning Hours

35

#### Total Maximum Student Learning Hours

35

### Corequisites

MATH M11 - College Algebra for Liberal Arts

## Requisite Justification

### Requisite Type

Corequisite

### Requisite

MATH M11 - College Algebra for Liberal Arts

### Requisite Description

Other (specify)

### Specify Other Requisite Description

The support course is intended to offer review material in support of the topics covered in the College Algebra for Liberal Arts course.

### Level of Scrutiny/Justification

Content review

## Student Learning Outcomes (CSLOs)

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

- |   |   |
|---|---|
| 1 | graph a line in the coordinate plane, and identify the slope and intercepts of the line.  |
| 2 | compare and contrast methods of solution to mathematical problems, such as solving quadratic equations by more than one method. |
| 3 | simplify a radical expression and identify its domain in the real numbers.  |

## Course Objectives

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

- |    |  |
|----|--|
| 1  | graph linear equations and test whether two lines are parallel, perpendicular, or neither.   |
| 2  | write the equation of a line in point-slope form, slope-intercept form, and standard form.   |
| 3  | factor basic polynomials.  |
| 4  | evaluate polynomial functions and solve polynomial equations by factoring and using the zero factor property.  |
| 5  | simplify rational expressions, perform operations with rational expressions, simplify complex fractions, and determine the domain of a simple rational function.                 |
| 6  | divide by a polynomial using long division and synthetic division.   |
| 7  | solve equations containing rational expressions.   |
| 8  | simplify rational exponent expressions using the properties of exponents and convert to radical notation.  |
| 9  | put radical expressions into simplest form, perform operations with radicals, solve equations containing radical expressions, and determine domain of a simple radical function. |
| 10 | add, subtract, multiply and divide complex numbers.  |
| 11 | solve quadratic equations by each of the following methods where applicable: factoring, the square root method, completing the square, and the quadratic formula.                |
| 12 | solve non-linear inequalities in one variable.   |
| 13 | describe the relationship between a function and its inverse geometrically and algebraically.  |

- 14 use geometric formulas to solve problems involving perimeter, circumference, and area.
- 15 set up a proportion, simplify ratios and solve equations involving percents, including applications.

## Course Content

### Lecture/Course Content

#### 10% A. Equations, Inequalities, and Problem Solving

1. Linear equations and their applications in one variable
2. Formulas and literal equations

#### 15% B. Graphs and Functions

1. Introduction to linear and non-linear functions
2. Review of graphs of linear equations and slope
3. Equations of linear functions

#### 25% C. Integer Exponents, Polynomials, and Polynomial Functions

1. Review of integer exponents, rules of exponents
2. Review of polynomials and operations on polynomials
3. Review of factoring
4. Solving polynomial equations by factoring
5. Evaluate polynomial functions

#### 20% D. Rational Expressions

1. Simplifying, adding, subtracting, multiplying, and dividing rational expressions
2. Simplifying complex fractions
3. Dividing polynomials using long division and synthetic division
4. Solving rational equations

#### 20% E. Radicals, Rational Exponents, and Complex Numbers

1. Radicals and radical functions
2. Simplifying, adding, subtracting, and multiplying radical expressions
3. Dividing radical expressions and rationalizing denominators
4. Complex numbers

#### 10% F. Quadratic Equations and Functions

1. Solving quadratic equations by the square root method, completing the square and the quadratic formula
2. Non-linear inequalities

## Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Problem solving exercises  
Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Skills demonstrations  
Other (specify)

### Other

Classroom discussions and student participation.

## Instructional Methodology

Specify the methods of instruction that may be employed in this course

Class activities  
Class discussions  
Distance Education  
Group discussions  
Instructor-guided interpretation and analysis  
Instructor-guided use of technology  
Lecture  
Small group activities

**Describe specific examples of the methods the instructor will use:**

- Engage students in group activities, whereby students demonstrate the graphing of basic functions, including lines.
- Instructor demonstration of the rules of exponents in simplifying expressions involving powers.
- Classroom discussion on the proper ways to simplify rational expressions.

**Representative Course Assignments****Writing Assignments**

1. Homework problems where answers require a written explanation of the solution, such as solving a system of linear equations and identifying if the system is consistent or inconsistent, dependent or independent.
2. Graded assignments: in-class and/or homework assignments, such as factoring a trinomial whose leading coefficient is not equal to 1 requiring complete solutions using both written English and symbolic mathematical language.

**Critical Thinking Assignments**

1. Apply analytic techniques for solving mathematical and application problems, such as finding the inverse of a one-to-one function.
2. Describe and apply the algorithmic steps for obtaining the solution to a mathematical problem, such as solving logarithmic equations.
3. Compare and contrast methods of solution to mathematical problems, such as solving quadratic equations by more than one method.

**Reading Assignments**

1. Viewing various diagrams in a textbook that show visual images of the graphs of linear functions and quadratic functions.
2. Reading mathematical content in a textbook, such as factoring formulas for squares, difference of squares, or sums and differences of cubes.

**Skills Demonstrations**

1. Demonstrate the solution to a quadratic equation by choosing the correct method from among graphing, completing the square, factoring, or using the quadratic formula.
2. Demonstrate the simplification of a rational expression by performing long division.

**Problem-Solving and Other Assignments (if applicable)**

1. Problem-solving exercises using geometric formulas to solve for perimeter, circumference, and area.
2. Problem-solving exercises with radical expressions.

**Outside Assignments****Representative Outside Assignments**

1. Group or individual projects which require student collaboration including written mathematical answers on paper or on the board.
2. Graded assignments: in-class and/or homework assignments requiring complete solutions using both written English and symbolic mathematical language.
3. Additional problem sets provided by the instructor, such as practice exercises on simplifying expressions.

**Articulation****Equivalent Courses at other CCCs**

College	Course ID	Course Title	Units
Las Positas College	NMAT 264	Math Jam for SLAM	0.0
Orange Coast College	MATH A090	Support for Liberal Arts Math	0.0
Modesto Junior College	MATH 33	Support Course for MATH 111	0.0

**Textbooks and Lab Manuals****Resource Type**

Textbook

**Classic Textbook**

Yes

**Description**

Martin-Gay, Elayn. *Intermediate Algebra*. 8th ed., Pearson, 2023.

**Resource Type**

Textbook

**Classic Textbook**

Yes

**Description**

Lial, Margaret, John Hornsby, and Terry McGinnis. *Intermediate Algebra*. 13th ed., Pearson, 2019.

**Resource Type**

Textbook

**Classic Textbook**

Yes

**Description**

Bittinger, Marvin L., Judith A. Beecher, and Barbara L. Johnson. *Intermediate Algebra*. 13<sup>th</sup> ed., Pearson, 2019.

**Resource Type**

Manual

**Description**

Khachadoorian, Vahe. *College Algebra with Support Workbook*. Moorpark College, 2019.

**Resource Type**

Textbook

**Classic Textbook**

No

**Description**

Abramson, Jay, et. al. *College Algebra*. E-book, OpenStax, 2020, <https://openstax.org/details/books/college-algebra> (<https://openstax.org/details/books/college-algebra/>). Accessed 17 September 2020.

**Library Resources****Assignments requiring library resources**

Use of textbooks on reserve. Use of computer stations available in the open access lab for any online assignments. Enrichment sources through the Library print and online resources for application problems, such as time, rate, motion examples.

**Sufficient Library Resources exist**

Yes

**Example of Assignments Requiring Library Resources**

Explore science books for examples of natural and architectural structures that exhibit common graphs of curves.

**Distance Education Addendum****Definitions****Distance Education Modalities**

Hybrid (1%–50% online)  
Hybrid (51%–99% online)  
100% online

## Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

## Regular Effective/Substantive Contact

### Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.
E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Face to Face (by student request; cannot be required)	Students requesting to speak to instructor in person for personal help on material, grade information, or discussion of policies and procedures.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

### Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.
E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Face to Face (by student request; cannot be required)	Students requesting to speak to instructor in person for personal help on material, grade information, or discussion of policies and procedures.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

### 100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Use of student discussion boards to discuss concepts from the material, solutions to homework problems, general discussion of techniques in solving problems, study skills, or arranging study groups.

E-mail	Responding to student queries about material, grade information, course policies and procedures, scheduling and due dates, submitting homework assignments, or making general announcements to the class.
Other DE (e.g., recorded lectures)	Posting of recorded lectures either by the instructor, recorded lessons available through campus resources, or use of public online resources available on the internet.
Synchronous Dialog (e.g., online chat)	Active live discussion with the instructor on material concepts, techniques for problem solving, feedback on solutions to problems, general chat on study skills, or answers to homework problems, quizzes or tests.

## Examinations

### Hybrid (1%–50% online) Modality

On campus  
Online

### Hybrid (51%–99% online) Modality

On campus  
Online

## Primary Minimum Qualification

MATHEMATICS

## Review and Approval Dates

### Department Chair

10/12/2022

### Dean

10/17/2022

### Technical Review

10/20/2022

### Curriculum Committee

11/01/2022

### DTRW-I

MM/DD/YYYY

### Curriculum Committee

MM/DD/YYYY

### Board

MM/DD/YYYY

### CCCCO

MM/DD/YYYY

### Control Number

CCC000621760

### DOE/accreditation approval date

MM/DD/YYYY