El Camino College

DCC Approval Date: November 10, 2018
Originator: Art Martinez

1. COURSE SPECIFICATIONS

1.1 Division: Mathematical Sciences
1.2 Department: Mathematics
1.3 Subject: Mathematics
1.4 Discipline(s): Mathematics
1.5 Course Information
1.5.1 Title and Number: Mathematics 80S
1.5.2 Descriptive Title: Intermediate Algebra Support
1.5.3 Catalog Description:
This course is designed to support students concurrently enrolled in Intermediate Algebra for Science, Technology, Engineering and Mathematics (Math 80). As needed, students review core skills and topics necessary to meet the intermediate algebra student learning outcomes and objectives. Students explore strategies and habits used by successful independent learners. Topics reviewed in this support course may include: computational fluency, algebraic symbolism and its use in solving problems, solving and graphing intermediate algebra functions using real-world application models, and systems of equations and inequalities in two variables. Students will study topics through multiple representations: tables, algebraic symbols, language, and graphs.

1.5.4 Prerequisite, Corequisite, Recommended Preparation, Enrollment Limitation (specify):
Corequisite
Justification: This corequisite course is necessary to satisfy AB 705. Its intent is to develop, strengthen and augment procedural, algebraic fluency and conceptual understanding needed for success in intermediate algebra. The implementation of this course will allow Math 80 classes to focus and explore topics in intermediate algebra in context to business, science, technology, engineering, and mathematics (BSTEM) real-world models.

1.5.5 Grading Method: ☐Letter ☒ Pass/No Pass ☐Both ☐No Grade
1.5.6 Degree Status: ☐ Associate Degree Credit ☒ Non-Degree Credit ☐ Non-Credit

1.6 Course Units, Hours, and Offerings
1.6.1 Credit Units: 2
1.6.2 Hours Lecture: 2 Hours Laboratory: _____ Activity Lab: _____
1.6.3 Maximum Semesters of Credit: 2 Maximum Credit Units: 2
1.6.4 Course Length: Full Term: X or Weeks:_____
1.6.5 Class Size: 35
1.6.6 Number of sections: Fall: _____ Spring: _____ Summer: _____ Winter: _____
1.6.7 Total enrollment per year: _____
1.6.8 Instructor Load: 13.34% WSCH/FTE Ratio: _____
1.6.9 Apportionment: ☒ Daily/Weekly Census ☐Positive Attendance ☐Distance Education
☐Independent Study ☐Non-Credit

1.7 Transfer and General Education
1.7.1 Proposed Transfer Articulation:
1.7.2 Proposed GE Patterns
El Camino College:

CSU GE:

IGETC:

2. PURPOSE OF COURSE

2.1 Course is designed for:

☐Transfer
☐Interdisciplinary
☐Occupational (preparatory)
☐Occupational (upgrade)
☒Precollegiate Basic Skills
☐Basic Skills (developmental)
☐Other (explain):_____

2.2 How widespread and established is this course at post-secondary institutions?
☐ Course is well-established and widely offered at many post-secondary institutions.
☐ Course is not yet found in many (or an) other post-secondary institutions.
☐ Traditional as generally offered in corresponding community colleges and/or four-year institutions.
☒ Not Applicable – Not for Transfer.

2.3 Examples of parallel courses at both California Community Colleges and CSUs or UCs. List the institution, the title and number of the parallel course, and the number of units. For each parallel course, attach copies of the appropriate pages of that college's or university's catalog. If the course is proposed for transfer, lower division status must be evident in the CSU or UC courses.

Cuyamaca Community College currently offers a parallel course. Cuyamaca College offers a co-requisite course for concurrent enrollment to support their Intermediate Algebra course: Math 010, Just-In-Time-Support for Intermediate Algebra, 3 units.

Math 80S is a support course for Math 80; therefore, it is not for transfer to CSU or UC.

3. JUSTIFICATION FOR THE COURSE

3.1 Explain how the course relates to the mission and goals of the College:

El Camino Community College must meet the requirements of AB 705. This course has been created to do so.

3.2 Explain how the course strengthens and relates to existing curriculum:

This support course is designed to support students with the underlying concepts, skills, and other knowledge needed to succeed in Intermediate Algebra (Math 80).

4. COURSE DEVELOPMENT INFORMATION

4.1 The following have been consulted in the development of the course.
4.1.1 Faculty: Mathematics Department
4.1.2 Counselor(s):
4.1.3 Students:

4.1.4 Advisory Committee(s):
4.1.5 Other:

4.2 Is the course similar to an existing course at El Camino College?
If yes, identify the similar course(s) and explain why this proposed course should be part of the El Camino College curriculum. **No.**

If the similar course exists in a different department, the proposed course must be submitted to that department for review. Record the comments below.

5. COURSE RESOURCE REQUIREMENTS

5.1 Library/Media Resources have been reviewed and determined to be adequate. Indicate the Library/Media Resources personnel consulted and provide the date of the consultation:
Claudia Striepe, November 13, 2018

5.2 Is the present faculty and staff adequate to support the offering of the course?
If no, specify proposed additions with anticipated cost and budget allocation. **Yes.**

5.3 Are facilities for teaching the course available?
If no, what plans have been made for accommodation? **Yes.**

5.4 Are special equipment and/or supplies necessary for teaching the course?
If yes, list, estimate cost, and provide budget allocation. **No.**

5.5 Are other special resources necessary?
If yes, list, estimate cost, and provide budget allocation. **No.**

6. METHODS FOR EVALUATING COUSE EFFECTIVENESS

☒ Faculty/department review
☐ Review of articulation agreement
☐ Student success/failure analysis
☐ Student surveys
☐ Review of advisory committee recommendations
☐ Review of industry needs and standards
☐ Review of entry-level job requirements
☐ Other (specify):

7. ACCOMODATIONS FOR STUDENTS WITH DISABILITIES AND INSTRUCTIONAL DELIVERY

1. In compliance with ECC Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973 - Sections 504 and 508, and the Americans with Disabilities Act, instructional delivery shall provide access, full inclusion, and effective communication for students with disabilities. Instructional delivery methods may include, but are not limited to, Braille/audiotape for print material, on-site interpreter/real-time transcription/live captioning for audio material, captioning for video material, alternative text for images, and captioning of audio information for electronic media materials (such as web and online).

Course Delivery Method
Face-to-Face Only

EL CAMINO COLLEGE
COURSE OUTLINE OF RECORD

I. GENERAL COURSE INFORMATION

Course Title and Number: Mathematics 80S

Descriptive Title: Intermediate Algebra Support

Discipline: Mathematics

Division: Mathematical Sciences

Course Length: ☒Full Term ☐Other (specify):

Hours Lecture: 2 Hours Laboratory: 0 Course Units: 2

Grading Method: ☐ Letter ☒ Pass/No Pass ☐ Both ☐ No Grade

Course Type: ☐ Credit, Degree Applicable ☐ Credit, Not Degree Applicable ☐ Non-Credit

Transfer CSU: ☐ Yes Effective Date ☐ Pending ☒ No

Transfer UC: ☐ Yes Approval Date ☐ Pending ☒ No

Conditions of Enrollment:

Placement in Mathematics 80S and co-enrollment in Mathematics 80

Catalog Description:

This course is designed to support students concurrently enrolled in Intermediate Algebra for Science, Technology, Engineering and Mathematics (Math 80). As needed, students review core skills and topics necessary to meet the intermediate algebra student learning outcomes and objectives. Students explore strategies and habits used by successful independent learners. Topics reviewed in this support course may include: computational fluency, algebraic symbolism and its use in solving problems, solving and graphing intermediate algebra functions using real-world application models, and systems of equations and inequalities in two variables. Students will study topics through multiple representations: tables, algebraic symbols, language, and graphs.

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES *List 3 student learning outcomes. Provide a short title for each. We have 4 learning outcomes for all our CMD courses.*

1. **Application Problems**: Students will be able to use multiple representations in order to complete application problems in their intermediate algebra course
2. **Solving Equations and Manipulating Expression**: Students will be able to solve equations and manipulate expressions in their intermediate algebra course
3. **Visual and Graphical Methods**: Students will be able to use visual and graphical methods to solve problems in their intermediate algebra course.
4. **Articulating Mathematical Reasoning**: Students will be able to verbally interpret, both orally or in writing, the mathematical reasoning used in solving problems in their intermediate algebra course.

B. COURSE OBJECTIVES List the major learning objectives for course. These must be stated in behaviorally measurable terms and demonstrate critical thinking skills.

Provide a representative assessment method for each from this list. If you select "other" give an explanation.

Essay Exam	Performance Exams	Objective Exams	Oral Exam	Quizzes
Reading Reports	Written Homework	Laboratory Reports	Fieldwork	Class Performance
Term or Other Papers	Multiple Choice	Completion	Other _____	

1. Demonstrate **computational fluency** at the intermediate algebra level: Students will evaluate numerical operations and algebraic expressions using integers, rational numbers and complex numbers.
2. Demonstrate fluency with **algebraic symbolism** at the intermediate algebra level: Students will understand the use of algebraic symbolism and be able to translate real-world problems into symbolic representations for a solution.
3. Demonstrate fluency with mathematical **functions** at the intermediate algebra level: Students will solve and graph linear, exponential, logarithmic, quadratic, polynomial, and rational functions.
4. Demonstrate fluency with **systems of equations and inequalities**: at the intermediate algebra level: Students will solve and graph systems of equations and inequalities in two variables.
5. Demonstrate fluency applying **mathematical modeling** at the intermediate algebra level: Students will model real-world problems using tables, graphs, algebraic functions, and interpret these results.

These course objectives will be measured using written homework and class performance.

III. OUTLINE OF SUBJECT MATTER Topics should be detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.

List hours as lecture or lab	Approx Time in Hours	Number each with a Roman numeral. I, II, III, etc.	Major Topics *Use outline format.* *A. List the Topic – Capitalize First Letter of All Words* *1. List Subtopics with Numerals*
Lecture	7	I	Support Concepts and Skills addressed as needed through just-in-time work to support intermediate algebra objectives and outcomes related to **computational fluency,** such as A. Basic arithmetic operations with integers, rational numbers, complex numbers, decimal numbers, and percentages in context to real-world problems B. Basic arithmetic operations using scientific notation C. Basic arithmetic involving integer and rational exponents D. Basic arithmetic operations on polynomial expressions E. Other critical concepts or skills as identified by the instructor
Lecture	8	II	Support Concepts and Skills addressed as needed through just-in-time work to support intermediate algebra objectives and outcomes related to **algebraic symbolism,** such as A. Symbolic techniques for solving linear, quadratic, rational, polynomial, radical, exponential, logarithmic, and absolute value equations and inequalities B. Symbolic techniques for simplifying, expanding, or factoring polynomials C. Graphical techniques for solving equations and inequalities D. Modeling verbally expressed problems numerically, symbolically and graphically E. Other critical concepts or skills as identified by the instructor
Lecture	7	III	Support Concepts and Skills addressed as needed through just-in-time work to support intermediate algebra objectives and outcomes related to **functions**, such as A. Operations on expressions for typical intermediate algebra functions, including those involving rational exponents, and absolute values B. Functions as rules, sets of ordered pairs, symbolic equations, and as graphs C. Invertibility of functions D. Graphs of typical intermediate algebra functions E. Analysis and interpretation of critical features of graphs of intermediate algebra functions, including domain, range, intercepts, and slope F. Modeling real-world problems using functions

			G. Other critical concepts or skills as identified by the instructor H.
Lecture	7	IV	Support Concepts and Skills addressed as needed through just-in-time work to support intermediate algebra objectives and outcomes related to **systems of equations and inequalities**, such as A. Solving systems of linear and nonlinear equations and inequalities algebraically and graphically B. Application problems using systems of equations and inequalities C. Other critical concepts or skills as identified by the instructor D.
	7	V	Support Concepts and Skills addressed as needed through just-in-time work to support intermediate algebra objectives and outcomes related to **mathematical modeling**, such as A. Modeling verbally expressed intermediate algebra problems numerically, symbolically and graphically B. Solving problems numerically, symbolically and graphically C. Other critical concepts or skills as identified by the instructor D.

Total Lecture Hours	36
Total Laboratory Hours	0
Total Hours	36

IV. PRIMARY METHODS OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION

Check the PRIMARY method of evaluation for this course.

☐Substantial writing assignments

☒Problem solving demonstrations (computational or non-computational)

☐Skills demonstrations

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION

1. Consider the function: $f(x) = 3x^2 - 2x - 1$
   (a) What are the y-intercepts, if any?
   (b) What are the x-intercepts, if any?
   (c) What are the domain and range?
   (d) Sketch the graph
   (e) Solve for f(x) = 4

C. COLLEGE LEVEL CRITICAL THINKING ASSIGNMENTS

1. Consider this problem: You're going to the mall with your friends and you have $200 to spend from your recent birthday money. You discover a store that has all jeans for $25 and all dresses for $50. You really, really want to take home 6 items of clothing because you "need" that many new things. Find out how many pairs of jeans and how many dresses you can buy so you use the whole $200 (tax not included – your parents promised to pay the tax)?

2. The following table contains U.S. population data for the two most recent census years, 2000 and 2010.

Census Year	U.S. Population (in millions)
2000	281.4
2010	308.7

   a. Steve thinks the data should be modeled by a linear function.
      I. What is the average rate of change in population per year according to this data?
      II. Write a formula for a linear function, $\boldsymbol{L}$, to estimate the population $\boldsymbol{t}$ years since the year 2000.
   b. Phillip thinks the data should be modeled by an exponential function.
      I. What is the growth rate of the population per year according to this data?
      II. Write a formula for an exponential function, $\boldsymbol{E}$, to estimate the population $\boldsymbol{t}$ years since the year 2000.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS: Select from this list. Use all that apply.

A. Check all planned instructional activities that apply:

☐ Class Performance	☐ Objective Exam
☐ Clinical Evaluation	☐ Oral Exams
☐ Completion	☐ Other Exams
☒ Embedded Questions	☐ Performance Exams
☐ Essay Exams	☐ Presentation
☐ Fieldwork	☐ Quizzes
☒ Homework Problems	☐ Reading Reports
☐ Journal kept throughout course	☐ Term or Other Papers

☐ Laboratory Reports
☐ Matching Items
☐ Multiple Choice
☐ True/False
☒ Written Homework
☐ Other (specify)

V. INSTRUCTIONAL METHODS: Select from this list. Use all that apply.
Double click box to check.

B. Check all planned instructional activities that apply:

☒ Lecture
☐ Lab
☒ Discussion
☐ Multimedia presentations
☒ Demonstration
☒ Group Activities
☐ Role play/simulation
☐ Guest Speakers
☐ Field trips
☒ Other: Affective Domain Activities
http://Affective Domain Link

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instructional delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS: Select from this list. Use all that apply.
Two hours work outside of class are required for each hour of lecture or equivalent. Each student in this course will be required to participate in the following work outside of class time. Check all that apply.

☒ Study
☒ Answer questions
☒ Skill practice
☒ Required reading
☒ Problem solving activity
☒ Written work (such as essay/composition/report/analysis/research)
☐ Journal (done on a continuing basis throughout the semester)
☐ Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting)
☐ Course is lab only - minimum required hours satisfied by scheduled lab time
☐ Other (specify)

Estimated Study Hours Per Week: 4.0 This should be 2 hours for each hour of lecture.

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Intermediate Algebra, Tussy/Gustafson, 5th edition, Cengage Learning, 2013.
Intermediate Algebra: Functions & Authentic Applications, Jay Lehmann, 5th edition, Pearson, 2015.

A. REQUIRED TEXTS (title, author, publisher, year)

B. REQUIRED SUPPLEMENTARY READINGS

C. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
Math 80	**Corequisite** This corequisite course is necessary to satisfy AB 705. Its intent is to develop, strengthen and augment procedural, algebraic fluency and conceptual understanding needed for success in intermediate algebra. The implementation of this course will allow Math 80 classes to focus and explore topics in intermediate algebra in context to business, science, technology, engineering, and mathematics (BSTEM) real-world models.

B. Requisite Skills

Requisite Skills
Math 80 - Carry out numerical operations and manipulate algebraic expressions, including expressions with rational and negative exponents, complex numbers, and logarithms MATH 40 - Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation **Category and Justification**

D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category **Enrollment Limitations Impact**

Course created by Art Martinez

BOARD APPROVAL DATE: (Leave Blank)

LAST BOARD APPROVAL DATE: (Leave Blank)

Last Reviewed and/or Revised by: Art Martinez

Date: November 10, 2018