

**EL CAMINO COLLEGE  
COURSE OUTLINE OF RECORD**

**I. COURSE DESCRIPTION**

Course Title and Number: Mathematics 73

Descriptive Title: Intermediate Algebra for General Education

Discipline: Mathematics

Division: Mathematical Sciences

Course Length:  Full Term  Other (specify): \_\_\_\_\_

Hours Lecture: 5 Hours Laboratory: \_\_\_\_\_ Course Units: 5

Grading Method:  Letter  Credit/No Credit  Both  No Grade

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

Transfer CSU:  Yes Effective Date \_\_\_\_\_  No

Transfer UC:  Yes Approval Date \_\_\_\_\_  Pending  No

Conditions of Enrollment:

Specify Prerequisite Corequisite, Recommended Preparation, Enrollment Limitation or None.

Prerequisite: Mathematics 40 or Mathematics 41B with a minimum grade of C in prerequisite or qualification by testing (El Camino College Mathematics Placement Test) and assessment

Catalog Description:

This intermediate algebra course is designed for students who are not considering further study in the sciences, technology, engineering or mathematics. In the context of studying basic functions and their graphs, students strengthen and expand their algebra skills. Functions studied include linear, quadratic, polynomial, rational, and radical functions, as well as the absolute value function. Particular emphasis is placed on the operations on functions, solving equations and inequalities, as well as using functions to model real life situations. Other topics include solving systems of equations and applications.

*Note: Mathematics 73 serves as a prerequisite course for all transfer-level mathematics course sequences, EXCEPT the calculus sequence (Mathematics 170, 180, 190, 191 and 220). Students who have passed Mathematics 73 and wish to enter the calculus sequence should consult a counselor. This intermediate algebra course satisfies the Associate of Arts and Associate of Science general education mathematics competency requirement.*

**II. COURSE OBJECTIVES**

List the major objectives of the course. These must be stated in behaviorally measurable terms.

1. Carry out numerical operations and manipulate algebraic expressions, including expressions with rational and negative exponents.

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2. Recognize functional relationships in the form of graphs, data or symbolic equations.
3. Solve problems involving a variety of function types, including linear, quadratic, polynomial, rational and radical functions, as well as the absolute value function.
4. Graph a variety of functions and relations and draw connections between these graphs and solutions to problems.
5. Solve a variety of equations and inequalities, as well as systems of equations and inequalities, using algebraic and graphical methods. Types of equations include linear, quadratic, polynomial, rational and radical equations, as well as absolute value equations.
6. Using numerical, symbolic and graphical methods, model application problems, solve them and interpret the results in the context of the problem.

### III. OUTLINE OF SUBJECT MATTER

The topics should be detailed enough to enable an instructor to determine the major areas that should be covered and so that the course may have consistency from instructor to instructor and semester to semester.

Approximate Time in Hours	Major Topics
Approximate Time	Major Topic
13	<u>Basic Operations and Manipulations:</u> <ul style="list-style-type: none"><li>• Review of operations on polynomial, rational and radical expressions</li><li>• Operations on power expressions with negative or rational exponents, as well as absolute value expressions</li><li>• Factoring polynomial expressions</li><li>• Rewriting radical expressions as expressions with rational exponents</li></ul>
18	<u>Functions:</u> <ul style="list-style-type: none"><li>• Definitions of function, domain and range</li><li>• Function notation</li><li>• Functions as rules, as sets of ordered pairs, as algebraic equations, and as graphs. Function types include polynomial, power, rational, radical, and the absolute value</li><li>• Operations on functions, including addition, subtraction, multiplication, division, exponentiation and composition</li><li>• Determining the equation for a linear function given the graph or sufficient data</li></ul>
19	<u>Graphing:</u> <ul style="list-style-type: none"><li>• Graphing functions of all types, especially the basic functions <math display="block">f(x) = x, x^2, x^3, \sqrt{x},  x , \frac{1}{x}.</math></li><li>• Graphing solutions to equations and inequalities</li><li>• Graphing quadratic functions using the completing-the-square technique to identify the vertex of a parabola</li><li>• Graphing equations of circles, using the completing-the-square technique to identify the center of the circle</li><li>• Transformations of graphs of functions, including translations, reflections and re-scalings</li></ul>

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Equations and Inequalities:

- Algebraic and graphical methods for solving equations and inequalities
- Techniques for solving quadratic inequalities over the real numbers
- Techniques for solving other equations and inequalities, which contain linear, quadratic, rational and radical expressions, as well as the absolute value of linear expressions
- Finding domains of radical and rational functions by setting up and solving appropriate inequalities
- Using interval notation to express solutions of inequalities
- Operations on sets: unions and intersections
- Systems of linear equations (2 x 2 systems only)

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Applications

- Modeling verbally expressed problems numerically, symbolically and graphically
- Solving problems numerically, symbolically and graphically
- Pattern recognition strategies
- Perimeter and area of rectangles, triangles and circles
- Pythagorean Theorem
- Rate, distance and time problems
- Other applied problems whose solutions utilize the function types listed above, as well as the types of equations and inequalities listed above
- Applied problems whose solutions require the use of systems of linear equations

Total: 90 hours

**IV . METHODS OF EVALUATION**

**A. CREDIT, DEGREE APPLICABLE AND CREDIT, NOT DEGREE APPLICABLE COURSES**

Check the PRIMARY method of evaluation for this course.

- Substantial writing assignments
- Problem solving demonstrations (computational or non-computational)
- Skills demonstrations

A minimum of one response in the categories 1, 2, or 3 below, as applicable, is required. However, you may check all that apply.

1. Indicate the types of writing assignments used as primary or secondary methods of evaluation for this course.

- |   |   |
|---|---|
| <input type="checkbox"/> Essay exams          | <input type="checkbox"/> Reading reports    |
| <input type="checkbox"/> Written homework     | <input type="checkbox"/> Laboratory reports |
| <input type="checkbox"/> Term or other papers | <input type="checkbox"/> Other (specify)    |

2. Indicate the types of problem-solving demonstrations used as primary or secondary methods of evaluation for this course.

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Exams   | <input checked="" type="checkbox"/> Homework problems |
| <input type="checkbox"/> Laboratory reports | <input type="checkbox"/> Fieldwork                    |
| <input checked="" type="checkbox"/> Quizzes | <input type="checkbox"/> Other (specify)              |

3. Indicate the types of skill demonstrations used as primary or secondary methods of

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evaluation for this course.

- Class performance
- Performance exams

- Fieldwork
- Other (specify)

4. If objective exams are also used, check all that apply.

- Multiple choice
- Completion
- Matching items

- True/false
- Other (specify)

**B. NON-CREDIT COURSE**

Indicate the methods of evaluation that will be used to determine that stated objectives have been met.

**V. COURSEWORK**

**A. TYPICAL ASSIGNMENT**

Provide an example of a typical assignment. This assignment must correspond to the PRIMARY method of evaluation indicated in Section IV, Methods of Evaluation. That is, it must be a writing assignment or, if more appropriate, an assignment involving problem solving or skill demonstration.

Solve the inequality  $x^2 - 2 > 2$ , check your work and present the solution in interval notation. Also, graph the solution on a number line.

**B. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS**

Cite two specific assignments that demonstrate college-level critical thinking. (Required for degree applicable courses only.)

1. Give an example of a quadratic equation in one variable that has 4 as its only solution. Explain why in a sentence or two and provide a graph to illustrate your reasoning.
2. If  $H(t) = 1.59t + 90.31$  is the total number of US households, in million, at  $t$  years since 1990 and if  $B(t) = 4.33t - 40.63$  is the number of Broadband cable subscribers and  $D(t) = 0.536t^2 - 10.32t + 52.85$  is the number of DSL subscribers, both in millions, at  $t$  years since 1990, find an equation for the percentage  $P(t)$  of US households who are either Broadband or DSL subscribers. Assume no one household subscribes to both services. Predict when 90% of US households will have either Broadband or DSL subscriptions.

**C. WORK OUTSIDE OF CLASS**

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)

**VI. INSTRUCTIONAL METHODOLOGY**

A. Check all planned instructional activities that apply:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Lecture       | <input type="checkbox"/> Group Activities     |
| <input type="checkbox"/> Lab                      | <input type="checkbox"/> Role play/simulation |
| <input type="checkbox"/> Discussion               | <input type="checkbox"/> Guest Speakers       |
| <input type="checkbox"/> Multimedia presentations | <input type="checkbox"/> Field trips          |
| <input type="checkbox"/> Demonstration            | <input type="checkbox"/> Other (specify)      |

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.

**VII. TEXTS AND MATERIALS**

If multiple selection is offered, only representative texts need be listed. An up-to-date list of required and recommended materials is maintained in the division office.

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

Intermediate Algebra, 3<sup>rd</sup> Edition, A. Tussy and R. Gustafson, Brooks/Cole, 2005

**B. REQUIRED SUPPLEMENTARY READINGS**

**C. OTHER REQUIRED MATERIALS**

**VIII. CONDITIONS OF ENROLLMENT**

If this course has a Prerequisite or Corequisite, complete section A. If this course has an Enrollment Limitation complete section B.

**A. PREREQUISITE AND/OR COREQUISITE**

1. Indicate if this course has a prerequisite or corequisite or both.

- Prerequisite     Corequisite     Both

2. Indicate Type. Check all that apply.

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Sequential  | <input type="checkbox"/> Computational/Communication Skills |
| <input type="checkbox"/> Health and Safety  | <input type="checkbox"/> Non-Course                         |
| <input type="checkbox"/> Standard (If this is a Standard prerequisite or corequisite, attach CCC Form D.) |   |

3. Entrance Skills/Knowledge

List the required skills and/or knowledge without which a student would be highly unlikely to receive a grade of A, B, C, or Credit (or for Health and Safety, would endanger self or others) in this course.

- a. Manipulate algebraic expressions including expressions with fractions and radicals
- b. Solve quadratic equations and systems of linear equations
- c. Graph systems of linear equations
- d. Solve application problems using linear and quadratic equations

**B. ENROLLMENT LIMITATION**

1. Indicate the category which describes the Enrollment Limitation for this course.
  - Band/Orchestra
  - Theater
  - Speech
  - Chorus
  - Journalism
  - Dance
  - Intercollegiate Athletics
  - Honors Course
  - Blocks of Courses
  - Other (specify)
2. List Degree and/or Certificate requirements that are met by this course.
3. List all El Camino College courses that also satisfy the requirements listed above in Section B.2.

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Originator: Lars Kjeseth Submittal Date: April 21, 2008

BOARD APPROVAL DATE: \_\_\_\_\_

Reviewed and/or Revised by:

\_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_ Date: \_\_\_\_\_

**REQUIRED SIGNATURES FOR NON-CREDIT COURSE**

College Curriculum Committee Chair

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Vice-President - Academic Affairs

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