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| **Course Prefix & Number:** MATH 040 C **CC Approved:** 10/28/08**DCCC Approved:** 12/05/08**Board Approved:** 02/10/09 |
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| **CYPRESS COLLEGECOURSE OUTLINE** |
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| **Division:**  | Science/Engineering/Math  |
| **Department/Subject Area:**  | Mathematics  |
| **Course Prefix:**  | MATH  |
| **Course Number:**  | 040 C  |
| **Course Title:**  | Intermediate Algebra  |
| **Units:**  | 4  |
| **Lec Hours: Full Term Hrs/Wk.**  | 4  |
| **Lab Hours: Full Term Hrs/Wk.**  | 0 **Scheduled**  |
| **Credit Hours:**  | 0  |
| **Assignment Preparation Hours:**  | 8  |
| **Prerequisite(s):** * A minimum grade of 'C' in MATH 020 C
* or Algebra I with a grade of 'C' or better AND the assessment process. Proof of prerequisites is required.
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| **Corequisite(s):** * None
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| **Advisory(ies):** * None
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| 1. **DESCRIPTIONS**
	1. **CATALOG DESCRIPTION**This is a second course in algebra that includes the topics of sets, axioms for the real number system, polynomials, solutions of linear and quadratic equations and inequalities, exponents and radicals, linear, quadratic, exponential and logarithmic functions and their graphs, and systems of equations. This course requires the use of a non-graphing scientific calculator.
	2. **SCHEDULE DESCRIPTION (max 2 lines):**A second course in algebra that covers sets, axioms for the real number system, polynomials, solutions of linear and quadratic equations and inequalities, and systems of equations.
2. **ENTRY LEVEL SKILLS AND KNOWLEDGE (To be completed if required by Prerequisite Policy)Upon entering this course, the student needs to be able to:**
	1. Add, subtract, multiply, and divide real numbers.
	2. Add, subtract, multiply, and divide polynomials.
	3. Add, subtract, multiply, and divide rational expressions.
	4. Add, subtract, multiply, and divide radical expressions.
	5. Translate between phrases written in English and equivalent expressions written in mathematical symbols.
	6. Factor polynomials.
	7. Solve linear equations and linear inequalities.
	8. Solve basic linear systems of two equations, two unknowns.
	9. Graph linear equations on a rectangular coordinate system.
	10. Solve quadratic equations with real solutions.
	11. Calculate ratios and solve proportions, including applications.
	12. Solve basic applications in linear equations and quadratic equations.
3. **INSTRUCTIONAL OBJECTIVES (Use measurable objectives only)Upon completion of this course, the student will be able to:**
	1. Translate between phrases written in English and equivalent expressions written in mathematical symbols.
	2. Solve linear, quadratic, logarithmic, and exponential equations. Solve linear and quadratic inequalities.
	3. Graph linear, quadratic, logarithmic and exponential equations and functions on a rectangular coordinate system. Graph linear inequalities on a rectangular coordinate system. Graph the conic sections on a rectangular coordinate system.
	4. Analyze and solve word problems.
	5. Utilize a scientific calculator whenever appropriate.
	6. Demonstrate the use of intermediate algebra skills and manipulative techniques involving the use of equations and graphing.
4. **COURSE CONTENT AND SCOPE (instructional topics or units)**
	1. The Real Numbers
		1. Sets
		2. Operations on the Set of Real Numbers
		3. Evaluating Expressions
		4. Properties of the Real Numbers
		5. Using the Properties
	2. Linear Equations, and Inequalities in One Variable
		1. Linear Equations in One Variable
		2. Formulas
		3. Compound Inequalities
		4. Absolute Value Equations and Inequalities
	3. Graphs and Functions in the Cartesian Coordinate System
		1. Graphing Lines in the Coordinate Plane
		2. Slope of a Line
		3. Three Forms of the Equation of a Line
		4. Linear Inequalities and Their Graphs
		5. Graphs of Functions
	4. Systems of Linear Equations
		1. Solving Systems by Graphing
		2. Solving Systems by Substitution
		3. Solving Systems by Elimination (Addition Method)
	5. Exponents and Polynomials
		1. Integral Exponents and Scientific Notation
		2. Exponent Rules
		3. Addition, Subtraction and Multiplication of Polynomials
		4. Multiplication of Binomials
		5. Division of Polynomials
		6. Factoring Binomials (Difference of Squares; Sum and Difference of Cubes)
		7. Factoring Trinomials
		8. Factoring by Grouping
		9. Solving Equations by Factoring
	6. Rational Expressions
		1. Properties of Rational Expressions
		2. Addition, Subtraction, Multiplication, and Division of Rational Expressions
		3. Complex Fractions
		4. Solving Equations Involving Rational Expressions
	7. Rational Exponents and Radicals
		1. Rational Exponents
		2. Radicals
		3. Operations with Radicals
		4. Solving Equations with Radicals and Exponents
		5. Complex Numbers
	8. Quadratic Equations and Inequalities
		1. Factoring
		2. Completing the Square
		3. The Quadratic Formula
		4. Quadratic Equations
		5. Quadratic and Rational Inequalities
	9. Exponential and Logarithmic Functions
		1. Exponential Functions
		2. Logarithms Functions
		3. Properties of Logarithms
		4. Solving Equations
	10. Problem Solving
		1. Solving Application Problems Using One Equation, One Unknown
		2. Solving Application Problems Using Two Equations, Two Unknowns
		3. Solving Applications Involving Uniform Motion/Work, Mixtures, Area, Perimeter, and the Pythagorean Theorem
			1. Using Linear Equations
			2. Using Rational Equations
			3. Using Quadratic Equations
		4. Solving Applications Involving Exponential and Logarithmic Functions
	11. Additional Function Topics
		1. Evaluating Functions at Given Values
		2. Combining Functions
		3. Variation
5. **INSTRUCTIONAL METHODOLOGIES (instructor initiated learning strategies):**
	1. Lecture/discussion
	2. Demonstration
	3. Collaborative Group Learning
	4. Article Handouts
	5. Multimedia Presentations
	6. Web Enhanced
	7. Use of manipulatives
	8. Assignments of problems sets and special projects
	9. Guided practice
	10. Encourage student attendance at Student Success workshops
	11. Encourage the use of supplementary instructional services provided by the LLRC
	12. Facilitating problem-solving sessions
	13. Use of Tablet PC to present interactive lessons and student participation in classroom activities
	14. Guided practice through optional online activities
6. **MULTIPLE METHODS OF EVALUATION (measurements of student achievement):**
	1. Exams/Tests
	2. Homework
	3. Quizzes
	4. Unit examinations -- minimum of four, the majority of which shall not be multiple choice or true/false. Students must show work and the work must be evaluated.
	5. A comprehensive final examination.
7. **LIST RECOMMENDED TEXTBOOKS:Texts such as the following are appropriate:**
	1. Martin-Gay, K.L. (2009).*Intermediate Algebra* (5th ed). Upper Saddle River: Pearson Education, Inc..
	2. MyMathLab.Pearson Education, Inc..,5th
	3. Supplemental materials: a scientific calculator
8. **LIST SUPPLEMENTAL TEXTBOOKS OR MATERIALS:Supplemental Reading or materials such as the following are appropriate:**
9. **ASSIGNMENTS:**
	1. Assignments that Demonstrate Critical Thinking
		1. Interpret and relate mathematics to real life applications.
		2. Create mathematical models to solve application problems.
		3. Distinguish between meaningful and extraneous solutions to problems.
		4. Distinguish between various kinds of real numbers.
	2. Writing Assignments and/or Proficiency Demonstration
		1. Written homework assignments and/or classroom examinations will demonstrate high levels of critical thinking as part of each class assignment. These assignments and/or examinations will also exhibit problem solving techniques.
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