

**CAPITAL COMMUNITY COLLEGE
COURSE OUTLINE
INTERMEDIATE ALGEBRA
SECTION I**

SUBJECT AREA & COURSE NUMBER: MAT* G137

COURSE TITLE: *Intermediate Algebra*

COURSE CATALOG DESCRIPTION: This course builds on the *Introductory Algebra* foundation, deepening the study of some topics, and introducing new ones. Topics include rational expressions, equations and inequalities, graphing, relations and functions, radicals and rational expressions, conics, and systems of equations. This course will include use of a graphing calculator.

LECTURE HOURS PER WEEK: 3

CREDIT HOURS: 3

PREREQUISITES: MAT* G094 or Qualifying score on Placement Test

SECTION II

A. SCOPE:

The objective of MAT* G137 is to enable the student to develop a solid understanding of algebra as a method for solving problems, and to work with, interrelate, and apply the principles of algebra governing: solutions of linear and quadratic equations (and certain other equations reducible to linear and quadratic forms), operations on radicals and rational expressions, the relationship between a graph and its equation, systems of equations, and functions.

B. REQUIRED WORK: determined by the instructor as described in the course syllabus

C. ATTENDANCE AND PARTICIPATION: Students are expected to attend each class, arrive on time, take exams at the scheduled time, and participate in the in-class learning process. (Specific instructor policies are included on the course syllabus).

D. METHODS OF INSTRUCTION: The methods of instruction are determined by each instructor and may include but are not limited to: lecture; lecture/discussion; small group collaborative learning; experiment/exploration; student presentations; use of technologies such as audio-visual materials; computer; and calculator.

5/20/04

E. OBJECTIVES, OUTCOMES, ASSESSMENT

The following objectives and outcomes represent the Science and Mathematics Department's core requirements for student achievement.

Legend: *C denotes continuing; *N denotes new.

To assure an effective articulation of *Introductory Algebra* and *Intermediate Algebra*, it is important to contrast learning outcomes continued from *Introductory Algebra* with those that are introduced for the first time in *Intermediate Algebra*. In the following table, the designator *C identifies learning outcomes continued from *Introductory Algebra*; the designator *N identifies learning outcomes that are addressed for the first time in *Intermediate Algebra*. Continued topics are treated more rapidly as a review, or they are extended and deepened.

LEARNING OBJECTIVES	LEARNING OUTCOMES	ASSESSMENT METHODS
To demonstrate an understanding of:	Student will:	As measured by:
1) Rational expressions	a) Add, subtract, multiply, and divide rational expressions *N b) Simplify rational expressions *N <u>Note:</u> This will directly use topics from MAT* G094 such as: axioms of the real number system, order of operation rules, and factoring polynomials over the integers. c) Find numbers for which a rational expression is not defined *N	Written in-class quizzes, tests, and examinations: presentations to the class;
2) Concepts related to equations and inequalities in one variable	a) Solve equations and inequalities that contain an absolute value (one and two variables) *N b) Solve quadratic equations by completing the square *N c) Solve quadratic equations by formula *N d) Formulate a quadratic equation that models an authentic situation, and use the equation to explore the situation *N e) Solve equations containing variables raised to rational number exponents *N	out-of-class projects; written reports; portfolios; class participation; homework assignments
3) Concepts related to equations in two variables	a) Solve for a variable in terms of other variables *C b) Use Distance formula *N c) Find the slope of a line *C d) Graph a linear equation by multiple methods *C e) Apply the slope relationships between parallel and perpendicular lines *N f) Given a line (2 points, point and slope, point and parallel to another line, point and perpendicular to another line), find its equation in various forms (point-slope, slope-intercept, general) *C g) Formulate a linear equation in two variables that models an authentic situation, and use the equation to explore the situation *C h) Solve a system of linear equations in two variables by elimination, substitution, and graphing *N i) Formulate a system of linear equations that models an authentic situation, and use the equations to explore the situation *N j) Work with conic sections as follows: *N <ul style="list-style-type: none"> • Use the definition of a circle to find its equation; convert between the center-radius form and the general form of an equation of a circle; graph the equation of a circle • Write the equation of a parabola whose axis of symmetry is parallel to a coordinate axis in the form: $y = a(x - h)^2 + k \text{ or } x = a(y - k)^2 + h$; graph the equation of such a parabola, and discuss its properties • Write the equation of an ellipse whose axes are parallel to the coordinates axes in the form: $\frac{(x - h)^2}{a^2} + \frac{(y - k)^2}{b^2} = 1$; graph the equation of such an ellipse, and discuss its properties. 	

E. OBJECTIVES, OUTCOMES, ASSESSMENT Continued:

4) Basic function concepts	<ul style="list-style-type: none"> a) Define a function *N b) Evaluate a function, both algebraically and graphically *N c) Find domain and range of a function *N d) Formulate a function that models an authentic situation, and use the function to explore the situation *N e) Graph special functions: linear, quadratic, exponential *N f) Define and evaluate the logarithm function *N 	
5) Radicals and Powers with rational exponents	<ul style="list-style-type: none"> a) Define and use powers with rational exponents *N b) Simplify radicals *N c) Operate on radicals (+, -, x, /) *N 	

Note 1: The foregoing table of learning outcomes should not be considered exhaustive: other learning outcomes may also support the objectives. The list is not intended to limit the learning outcomes that can be used to achieve the objectives.

Note 2: The order in which the learning outcomes are addressed and the relative emphasis given to each will vary from instructor to instructor.

Note 3: There is no expectation that an instructor will employ all the assessment methods or any particular set of them. Also, the list of applicable assessment methods is not exhaustive. Other methods that measure the learning outcomes may be used.

Note 4: It is important to recognize that courses are not delivered in a social vacuum. Any bona fide assessment of a course must take account of out-of-class life demands on students that adversely impact academic success.

F. TEXTS AND MATERIALS: A text selected by the Mathematics Section of the Science and Mathematics Department with content and presentation that support the Learning Objectives and Outcomes given in Part E above.

G. INFORMATION TECHNOLOGY: A graphing calculator