COURSE OUTLINE

Course Number	Course Title	Credits
MAT042	Foundation Math II	3

Hours: lecture/Lab/Other	Pre-requisite	Implementation sem/year
0/6	MAT041 or MAT033 or appropriate score on the Accuplacer test	Spring 2011

Catalog description (2006-2009 Catalog): Developmental mathematics course designed for those students that need a review of basic algebra. Topics include linear equations, polynomial operations, rational expressions and radical expressions. Students will work through the material in mastery-based modules in a lab setting. [Does not fulfill mathematics elective requirement]

Is course New, Revised, or Modified? Modified

Required texts/other materials:

Carnegie Learning Software

Revision date:
Fall 2010

Course coordinator:
Betty Peterson, petersob@mccc.edu, 609-570-3421

Information resources:
There are many resources available for this course. The library has a wide assortment of books available on these topics.

Other learning resources:
Tutors available at both campuses.

Course Competencies/Goals:

As this is a foundation level mathematics course, the course should first and foremost prepare the students for future college level work in mathematics. The students should develop confidence in their abilities to perform mathematics successfully. They should gain experiences that connect their classroom learning with real-world applications of mathematics and be able to build techniques of reasoning for effective problem solving that they can translate to other settings.

The student will be able to:

I. Develop a strategy for solving linear equations and inequalities.
II. Generate graphs of linear equations with two unknowns to provide visual solutions for both single equations as well as systems of equations.
III. Synthesize the rules of exponents and polynomial operations to simplify algebraic expressions to a standard form.
IV. Distinguish polynomials in order to apply correct techniques of factoring.
V. Adapt the techniques of factoring polynomials to solve quadratic equations.
VI. Apply the arithmetic operations of addition, subtraction, multiplication and division to both rational expressions and radical expressions.

Course-specific General Education Knowledge Goals and Core Skills.

General Education Knowledge Goals

Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

MCCC Core Skills

Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

Goal F. Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.

Units of study in detail.

Unit I Linear Equations and Inequalities

Learning Objectives

The student will be able to…

- Use the properties of equality to solve equations. (Course Competency I)
- Solve a literal equation for one of the unknowns. (Course Competency I, MCCC Core Skills B)
- Translating written English phrases into algebraic expressions. (Course Competency I, MCCC Core Skills B)
- Solve application problems involving equalities. (Course Competency I, MCCC Core Skills B and F)
- Solve linear inequalities and express the solution graphically and as an interval. (Course Competency I)
- Graph linear compound inequalities. (Course Competency I)
- Solve application problems involving inequalities. (Course Competency I, MCCC Core Skills B and F)
- Find ordered pairs that are solutions to linear equations and determine if they are correct. (Course Competency II)

- Understand slope as being a rate of change. (Course Competency II and MCCC Core Skills B)
- Graph linear equations of the form $y = mx + b$ and $Ax + By = C$ by using a table of values. (Course Competency II)
- Graph a line that passes through a given point and has a given slope. (Course Competency II)
- Determine whether two given lines are parallel or perpendicular. (Course Competency II)
- Determine the x and y intercept of linear equations. (Course Competency II and MCCC Core Skills B)
- Solve application problems involving linear equations. (Course Competency II and MCCC Core Skills F)
- Solve a system of two linear equations with two unknowns by graphing. (Course Competency II and MCCC Core Skills B)

Unit II **Exponents and Polynomials**

Learning Objectives

The student will be able to…

- Classify and evaluate polynomials. (Course Competency III and MCCC Core Skills B)
- Apply the mathematical operations of addition and subtraction to polynomials. (Course Competency III)
- Apply the rules of exponents to simplify expressions, multiply polynomials and divide polynomials. (Course Competency III and MCCC Core Skills B)
- Apply rules for integer exponents to scientific notation. (Course Competency III and MCCC Core Skills B)
- Solve application problems involving polynomials and scientific notation. (Course Competency III and MCCC Core Skills B, F)

Unit III **Factoring and Quadratic Equations**

Learning Objectives

The student will be able to…

- Identify the greatest common factor and use it to factor a polynomial. (Course Competency IV and MCCC Core Skills B)
- Factor by grouping. (Course Competency IV)
- Factor quadratic expressions, $ax^2 + bx + c$ when $a = 1$ and when $a \neq 1$. (Course Competency IV and MCCC Core Skills B)
- Factor trinomials of higher order by removing a GCF first then factoring the remaining quadratic factor. (Course Competency IV and MCCC Core Skills B)
- Factoring special products such as difference of two squares and perfect square trinomials. (Course Competency IV)
- Solve quadratic equations by factoring. (Course Competency V and MCCC Core Skills B)

Unit IV **Rational Expressions and Radicals**

Learning Objectives

The student will be able to…

- Simplify rational expressions. (Course Competency VI and MCCC Core Skills B)
- Perform arithmetic operations with rational expressions. (Course Competency VI)
- Solve rational equations. (Course Competency VI and MCCC Core Skills B)
- Simplify radicals with algebraic expressions. (Course Competency VI)
- Perform arithmetic operations with radicals. (Course Competency VI)
- Solve application problems involving rational expressions or radicals. (Course Competency VI and MCCC Core Skills B)

As this is a mathematics course, by nature all the learning objectives support the General Education Goal 2. However, this is a foundations level course and as such it is not expected that the students would use this course as a general education course.

Evaluation of student learning:

Grade will be based on the following percentages:
Tests 70%
Class work 15%
Notebooks 10%
Attendance 5%

Multiple choice questions on the departmental unit tests will reflect each of the unit objectives listed above and be administered in the lab. Students will take a pretest on each module. Students scoring above an 80% on the pretest will be moved to the next module for the course, or to a module that incorporates intermediate algebra curriculum. Any student scoring below this will be required to work through the material on the software. They will be required to keep a notebook with both notes and work. Once they have completed the work for the module they will be required to take a post test on the material. If they do not demonstrate mastery, they will be required to complete additional time in the module before moving to a new module. All students must demonstrate mastery of the curriculum.

The test component will be the average of their highest four modules for the semester. To take a post test, students must present their notebooks to their instructor. The notebooks will be checked for both class work and notes from the current module.

Academic Integrity Statement:

Mercer County Community College is committed to academic integrity – the honest, fair and continuing pursuit of knowledge, free from fraud or deception.

- Students should never:
    - Knowingly represent the work of others as their own
    - Knowingly represent previously completed academic work as current
    - Fabricate data to support academic work
    - Use or obtain unauthorized assistance in the execution of any academic work
    - Give fraudulent assistance to other students
    - Unethically use technological means to gain academic advantages

Violators of the above actions will be penalized. For a single violation the faculty member will determine the course of action. This may include, assigning a lower grade on the assignment, lowering the course grade, failing the student, or another penalty that is appropriate to the violation. The student will be reported to the Academic Integrity Committee, who may impose other penalties for a second (or later) violation. The student has right to a hearing and also to appeal any decisions. These rights are outlined in the student handbook.