Hagerstown Community College Master Syllabus
MAT 090: Foundations of Algebra

Course Information
MAT 090: Foundations of Algebra
Fall 2019
3 credits

Instructor Information
Lead Instructors: Carrie Hawbecker and Rebecca Westmeyer

Course Description
This is a preparatory course covering select topics normally covered in high school Algebra I and II, such as simplifying algebraic expressions, solving equations, and graphing. This course is designed to prepare students for MAT 101 - College Algebra or MAT 114 - Applied Algebra. (3 credits) Total of 45 hours of lecture. Prerequisite: Appropriate score on placement test.

Course Materials

Student Learning Outcomes
Upon completion of this course, students will be able to:
1. Simplify algebraic expressions (involving real number, polynomials, and rationals) using appropriate rules.
2. Combine algebraic expressions (involving polynomials, radicals, and rationals) through addition, subtraction, multiplication, and division.
3. Factor polynomial expressions.
4. Solve algebraic equations (including linear, quadratic, polynomial, and rational).
5. Write equations of lines.
6. Graph linear equations.
7. Communicate, interpret, and explain mathematical concepts using appropriate symbolic notation and vocabulary.
8. Use mathematical equations to construct and solve word problems in various contexts, and interpret results with appropriate terms and units.
Definition of Credit Hour
To earn one academic credit at HCC, students are required to complete a minimum of 37.5 clock hours (45 fifty-minute academic hours) of coursework per semester. Those hours of coursework may be completed through a combination of hours in the classroom and hours outside the classroom. Certain courses may require more than the 37.5 minimum hours of coursework per credit. For most classes, students should expect to complete at least 2 hours of coursework outside of class for each hour of in-class coursework.

Minimum clock hours required for this course

(Lecture) MAT-090, a 3-credit course, has an average time commitment of 112.5 hours. Of that, 35 hours will be spent in the classroom (for lecture and off-line assignments), approximately 55 hours will be spent completing XYZ homework and quizzes, and 22 hours will be spent studying for and taking exams.

(Hybrid) MAT-090, a 3-credit course, has an average time commitment of 112.5 hours. Of that, 19 hours will be spent in the classroom (for lecture), 16 hours will be spent working outside of class on off-line assignments, approximately 55 hours will be spent completing XYZ homework and quizzes, and 22 hours will be spent studying for and taking exams.

(Web) MAT-090, a 3-credit course, has an average time commitment of 112.5 hours. Of that, 19 hours will be spent watching videos, reading the text, etc., 16 hours will be spent working on off-line assignments, approximately 55 hours will be spent completing XYZ homework and quizzes, and 22 hours will be spent studying for and taking exams.

Services for Students with Disabilities: Students may receive reasonable accommodations if they have a diagnosed disability and present appropriate documentation. Students seeking accommodations are required to contact the Disability Support Services (DSS) office as early as possible. Students may contact a DSS staff member for an appointment at dss@hagerstowncc.edu or at 240-500-2530.
Course Content Objectives

Upon completion of the course, students will be able to:

1) Convert within and between US and metric units of measure.
2) Simplify expressions using the order of operations.
3) Simplify expressions using the rules of exponents, including negative exponents.
4) Simplify algebraic expressions.
5) Add, subtract, multiply, and divide simple polynomials.
6) Solve linear equations in one variable.
7) Solve linear inequalities in one variable.
8) Solve application problems involving formulas, geometry, motion, percent, and proportions.
9) Graph linear equations in slope-intercept form.
10) Graph linear equations using intercepts.
11) Write equations of lines in slope-intercept form.
12) Factor polynomial expressions.
13) Solve polynomial equations by factoring.
14) Solve quadratic equations using the square root property
15) Solve quadratic equations using the quadratic formula.
16) Solve application problems involving quadratic models.
17) Simplify radical expressions.
18) Simplify expressions involving rational exponents.
19) Add, subtract, and multiply radical expressions.
20) Simplify rational expressions.
21) Add, subtract, multiply and divide rational expressions.
22) Solve rational equations.
23) Solve rational equations involving applications such as proportions, formulas, and work.
Topical Outline

Unit 1 – Chapters 1 and 2
1. Measurement
   1.1. Linear conversions
   1.2. Weight and mass conversions
   1.3. Capacity conversions
   1.4. US to metric conversions

2. Algebraic Expressions, Exponents, and Polynomials
   2.1. Simplify; order of operations
   2.2. Simplify; exponents and negative exponents
   2.3. Simplify algebraic expressions
   2.4. Add/subtract polynomials
   2.5. Multiply polynomials
   2.6. Divide simple polynomials

Unit 2 – Chapters 3 and 4
3. Linear Equations and Inequalities
   3.1. Solve linear equations
   3.2. Solve linear inequalities
   3.3. Solve applications involving linear models (formulas, geometry, percent, and proportions)

4. Equations of Lines
   4.1. Intro to graphing
   4.2. Graph using slope-intercept form
   4.3. Graph using intercepts
   4.4. Write equations of lines in slope-intercept form

Unit 3 – Chapters 5 and 6
5. Factoring Polynomials
   5.1. Greatest common factor and factor by grouping
   5.2. Factor trinomials with leading coefficient of 1
   5.3. Factor trinomials with leading coefficient other than 1 (AC method)
   5.4. Factor special products

6. Radical Expressions
   6.1. Simplify radical expressions
   6.2. Simplify expressions involving rational exponents
   6.3. Add, subtract, and multiply radical expressions

Unit 4 – Chapters 7 and 8
7. Quadratic Equations
   7.1. Solve equations by factoring (zero product property)
   7.2. Solve quadratic equations using the square root property
   7.3. Solve quadratic equations using the quadratic formula
   7.4. Solve application problems involving quadratic models
8. Rational Expressions and Equations
   8.1. Simplify, multiply, and divide rational expressions
   8.2. Add and subtract rational expressions
   8.3. Solve rational equations
   8.4. Solve application problems involving rational models (proportions, formulas, rate of work)