**MTH 099( sec 212) Syllabus:** Mathematics Skills II – **Spring 2014**

**CRN:4659** Day/Time: **T,R 12:30-1:45pm** Classroom: **Smith Hall 514**

**Instructor: Alan Horwitz Office: Smith Hall Room 741**

**Email: horwitz@marshall.edu Office Hours: *To be announced……….***

**Phone: 304-696-3046**

**Prerequisites:** ACT 17 – 18 **OR** SAT equivalent **OR** successful completion of WMTH 001 or MTH 098.

**Course Description:** The purpose of this course is to prepare students with low placement test scores to take college level mathematics courses required in their program of study.

Note: This is a 3 hour course and will count toward full time enrollment status, but does not count toward graduation or GPA. A grade of **Credit** or **No Credit** will be assigned.

**Learning Objectives:** Students shall be able to:

* categorize expressions versus equations, employing appropriate mathematical properties to demonstrate an understanding of linear expressions and equations;
* employ appropriate mathematical properties to demonstrate an advanced understanding of the operations on and simplification of polynomial, rational, and radical expressions, including factoring;
* articulate algebraic meanings for the solutions to linear, quadratic, rational, and radical equations, and also provide graphical representations for the solution(s) to linear equations;
* assimilate information, individually or in a group, from a variety of sources to formulate successful study skills and problem solving strategies.

**Required Materials:**

**TEXTBOOK COMPONENT:**

* **Introductory Algebra 2nd Edition. 2009. Miller, O’Neil, Hyde.** ISBN#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ONLINE COMPONENT:**

* **CONNECT MATH Access Code –** ISBN#:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Each item may be purchased separately or both may be purchased under the following ISBN#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**CONNECT MATH:**  Connect is the online homework tool and access must be purchased to meet the requirements for the Connect portion of the course. Students are required to have access to a computer outside of class.

**CALCULATOR:** A calculator should be used only when you are instructed to do so. The TI-83/TI-83 plus or similar graphing calculator is recommended for students continuing into MTH 127/MTH 130 and other higher level courses. A scientific calculator is recommended for students continuing into MTH 121. Students may not utilize cell phones as calculators during tests.

 **Course Policies:**

**ATTENDANCE: It is expected that each student shows up on time and is prepared for class. Attendance is necessary for the successful completion of this course.** A student may have an absence officially excused at The Office of Student Affairs, Memorial Student Center MSC 2W38. The student must **also show** the instructor the documentation ( e.g. doctor's excuse, note from a coach, note from court clerk, etc. )

**A**ny unexcused absence on the day of an exam will result in a score of zero.  **Only an excused absence will** **warrant a make-up exam** to be scheduled during Dead Week.

**OUTSIDE CLASSROOM REQUIREMENTS: Students will need to *work at least 2-4 hours outside of class for every 1 hour spent in class,* studying notes and the textbook, completing homework from the book, and completing assignments in Connect to meet the requirements of the course.**

**CLASSROOM ETIQUETTE:** During class, cell phones must be turned off and out of sight. Please make the instructor aware ahead of time if access to these devices is needed.

**TUTORING FACILITIES:** Marshall University provides multiple options for free on-campus tutoring. The Mathematics Department tutoring lab is located in in Smith Music Hall 115. The University College has a tutoring lab on the first floor of Laidley Hall. It is the student’s responsibility to take advantage of these facilities in addition to utilizing office hours.

#### UNIVERSITY POLICIES: By enrolling in this course, students agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page\_id=802 Policies include: Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

#### ****FINAL EXAM:** The MTH 099 **Common Final Exam** will be held on **Saturday, May 3rd at 2:00 p.m.** The instructor will announce the location.**

**GRADE CALCULATION:** Since there are multiple ways in which students learn, knowledge and understanding will be assessed with multiple tools. A student’s grade is assessed by the number of points earned in each of the following categories:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **% of Grade** | **Points** |  |  |  |
| In-Class Exams | 30% | 300 pts. |  |  |  |
| Comprehensive Final Exam | 30% | 300 pts. |  | **Credit:** | 75% **or higher** overall |
| Online Homework Tool | 20% | 200pts. |  | **No Credit:** | **Less than** 75% overall |
| Miscellaneous\*\* (**see below**) | 20% | 200pts. |  |  |  |
| **Total:** | **100%** | **1000 pts.** |  |  |  |

Students are required to take the comprehensive final exam in order to pass the course.

**Important Dates:**

\*\* Instructors may decide how to categorize the remaining 20% of the course points in order to represent student work (**attendance**, in-class/group work, **quizzes**, etc.) At least 20% of the grade must be assigned to homework completed using Connect, but more may be allotted if Connect used for more than half of the student work in the course.\*\* See below….

1/20/14  **Martin Luther King Day – University Closed**

3/10/14 **Freshman Midterm D and F Grades Due**

3/17/14 – 3/22/14 **Spring Break – No Classes**

3/28/14 **Last Day to Drop a Full Semester Course**

4/28/14 – 5/2/14 **Dead Week**

5/3/14 **MTH 099 Common Final Exam Day (2:00 pm)**

**MISCELLANEOUS: In class ( *surprise* ) quizzes & collected homework: 15% ( 150 points )**

 **Attendance: 5% ( 50 points )**

 **Total: 20% ( 200 points )**

**POLICY ON QUIZZES: No makeups, but I drop the two lowest quiz grades.**

**POLICY ON ATTENDANCE: Everyone starts with 50 points for attendance. You lose 3 points**

 **from your 50 point attendance score for each absence, or for being late**

 **regardless of whether there's a good or bad reason or whether**

 **the absence is excused.**

**General Syllabus**

**MTH 099 – Basic Skills in Mathematics II**

**Course Description**

The purpose of this course is to adequately prepare students with low placement test scores to take college level Mathematics courses required in their program of study.

**3 hours** Credit/No Credit **PR**: Math ACT 17, 18 or MTH 098

**Course Topics**

* Real Numbers
* Linear Equations and Inequalities in One Variable
* Linear Equations and Inequalities in Two Variables
* Functions
* Polynomials and Properties of Exponents
* Factoring Polynomials
* Rational Expressions and Equations
* Radical Expressions and Equations
* Solving Quadratic Equations

**Learning Goals**

* Real Numbers - Students shall be able to:
	+ use the real number line to order and Venn Diagrams to categorize different types of numbers,
	+ apply Order of Operations to real number expressions, and
	+ use the properties of real numbers to simplify expressions.
* Linear Equations and Inequalities in One Variable - Students shall be able to:
	+ apply the additive and multiplicative properties of equality to solve linear equations,
	+ solve application problems, and
	+ solve linear inequalities and graph the solution set.
* Linear Equations and Inequalities in Two Variables - Students shall be able to:
	+ plot solutions to linear equations in two variables,
	+ interpret the slope of a line as a rate of change, including vertical and horizontal lines,
	+ gather information used to graph a line from the Slope-Intercept and Point-Slope forms of the equation for a line,
	+ create the Slope-Intercept and Point-Slope forms of a line from given information,
	+ solve linear equation modeling problems, and
	+ graph linear inequalities in two variables.
* Functions – Students shall be able to:
	+ differentiate between relations and functions,
	+ utilize function notation, $f(x)$, to evaluate for given values of $x$,
	+ discuss the domain and range of linear and quadratic functions , and
	+ apply the vertical line test to determine if a graph represents a function.
* Polynomials and Properties of Exponents - Students shall be able to:
	+ describe polynomials using their degree and number of terms,
	+ apply the properties of exponents to simplify multivariate expressions,
	+ convert to and from scientific notation in order to perform operations,
	+ add, subtract, and multiply polynomials, and
	+ divide polynomials by monomials.
* Factoring Polynomials - Student shall be able to:
	+ factor using the GCF and by grouping,
	+ factor quadratic trinomials with $x^{2} and ax^{2}$ as leading terms, and
	+ factor perfect square trinomials and difference of squares.
* Rational Expressions and Equations- Students shall be able to:
	+ multiply and divide rational expressions,
	+ add and subtract rational expressions with like and unlike denominators, and
	+ solve rational equations, including those where domain restrictions cause extraneous solutions.
* Radical Expressions and Equations- Students shall be able to:
	+ simplify radical expressions,
	+ add, subtract, and multiply radical expressions,
	+ use division property to simplify radical expressions, and
	+ solve equations containing radical expressions, including those with extraneous solutions.
* Solving Quadratic Equations - Students shall be able to:
	+ solve quadratic equations using the zero product rule,
	+ solve quadratic equations using the square root property, and
	+ solve quadratic equations using the quadratic formula.

**Technology Component**

 Students will be able to use a calculator for some parts of this course. After all initial arithmetic assessments, students shall utilize calculators to make large computations more manageable. Students will also need computer and internet access for utilizing MUOnline, the course announcements and grades tool. Access to a computer and internet is also required for the online homework tool used throughout the course.

**Assessment**

 Students will experience a variety of assessments throughout the semester, such as out-of-class assignments, including online homework and other assignments determined by the instructor, in-class group activities, quizzes, and examinations. A comprehensive final exam along with the in-class exams will comprise a majority of the grade calculation. Students must show mastery of at least 75% of the course assessments to earn credit for the course.

 **MTH 099 Section Coverage**

 (refer to calendar for suggested semester outline)

Textbook: ***Introductory Algebra 2nd Edition. 2009.* Miller, O’Neil, Hyde*.***

**The following sections must be covered:** (Please note that only part of sections 4.5 and 8.5 are required.)

[Review] Chapter R: Reference

* + R.1 Study Tips
	+ R.2 Fractions
	+ R.3 Decimals and Percentages
	+ R.4 Introduction to Geometry

Chapter 1: The Set of Real Numbers

* + 1.1 Sets of Numbers and the Real Number Line
	+ 1.2 Exponents, Square Roots, and the Order of Operations
	+ 1.3 Addition of Real Numbers
	+ 1.4 Subtraction of Real Numbers
	+ 1.5 Multiplication and Division of Real Numbers
	+ 1.6 Properties of Real Numbers and Simplifying Expressions

Chapter 2: Linear Equations and Inequalities

* + 2.1 Addition, Subtraction, Multiplication, and Division Properties of Equality
	+ 2.2 Solving Linear Equations
	+ 2.3 Linear Equations: Clearing Fractions and Decimals
	+ 2.4 Applications of Linear Equations: Introduction to Problem Solving
	+ 2.6 Formulas and Applications of Geometry
	+ 2.8 Linear Inequalities

Chapter 3: Graphing Linear Equations in Two Variables

* + 3.1 Rectangular Coordinate System
	+ 3.2 Linear Equations in Two Variables
	+ 3.3 Slope of a Line and Rate of Change
	+ 3.4 Slope-Intercept Form of a Line
	+ 3.5 Point-Slope Formula
	+ 3.6 Applications of Linear Equations and Modeling
	+ 3.7 Introduction to Functions

Chapter 4: Systems of Linear Equations in Two Variables

* + 4.5 Linear Inequalities ~~and Systems of Inequalities~~ in Two Variables

Chapter 5: Polynomials and Properties of Exponents

* + 5.1 Exponents: Multiplying and Dividing Common Bases
	+ 5.2 More Properties of Exponents
	+ 5.3 Definitions of $b^{0}$ and $b^{-n}$
	+ 5.4 Scientific Notation
	+ 5.5 Addition and Subtraction of Polynomials
	+ 5.6 Multiplication of Polynomials and Special Products
	+ 5.7 Division of Polynomials (by monomials only)

 **MTH 099 Section Coverage**

 **(continued)**

 Chapter 6: Factoring Polynomials

* + 6.1 Greatest Common Factor and Factoring by Grouping
	+ 6.2 Factoring Trinomials of the form $x^{2}+bx+c$
	+ 6.3 Factoring Trinomials: Trial-and-Error Method
	+ 6.4 Factoring Trinomials: AC-Method
	+ 6.5 Difference of Squares and Perfect Square Trinomials
	+ 6.7 Solving Equations Using the Zero Product Rule

Chapter 7: Rational Expressions

* + 7.1 Introduction to Rational Expressions
	+ 7.2 Multiplication and Division of Rational Expressions
	+ 7.3 Least Common Denominator
	+ 7.4 Addition and Subtraction of Rational Expressions
	+ 7.6 Rational Equations

Chapter 8: Radicals

* + 8.1 Introduction to Roots and Radicals
	+ 8.2 Simplifying Radicals
	+ 8.3 Addition and Subtraction of Radicals
	+ 8.4 Multiplication of Radicals
	+ 8.5 Division of Radicals ~~and Rationalization~~
	+ 8.6 Radical Equations

Chapter 9: More Quadratic Equations

* + 9.1 Square Root Property
	+ 9.3 Quadratic Formula

**The following sections should be covered if time permits:**

Chapter 2: Linear Equations and Inequalities

* 2.5 Applications Involving Percentages

Chapter 4: Systems of Linear Equations in Two Variables

* 4.1 Solving Systems of Equations by the Graphing Method

Chapter 6: Factoring Polynomials

* 6.6 Sum and Difference of Cubes

Chapter 7: Rational Expressions

* 7.5 Complex Fractions

Chapter 8: Radicals

 8.7 Rational Exponents