Marshall University
MTH 127 Syllabus

Course Title/Number	College Algebra-Expanded Version - MTH 127
Semester/Year	Spring 2018
Section/CRN	204 / 3915
Days/Time	MTWRF 11:00 – 11:50
Location	SH 513 (MWF) / SH 624 (TR)
Instructor	Rob-Roy Mace
Office	SH 743E
Phone	(304)696-7040
E-Mail	mace22@marshall.edu or Blackboard Messages
Office Hours	MTWRF 9:55 am – 10:55 am

University Policies	By enrolling in this course, you 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 www.marshall.edu/academic-affairs/policies/. 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

Course Description: From Catalog

A brief but careful review of the main techniques of algebra. Polynomial, rational, exponential, and logarithmic functions. Graphs, equations and inequalities, sequences.

Prerequisite: Math ACT 17-20 or C or better in MTH 099, MTH 102, or MTH 102B.

5 credit hours.

Courses that have MTH 127/130 as a prerequisite

- Graduation Requirement for College of Business
- MTH 122 - Trigonometry, MTH 132 - Precalculus, MTH 140 - Applied calculus
  CHM 111, CS 110, CI 248, ENGR 221, IST 420/421, PS 109, PHY 101, PHY 201

This course is intended to prepare students for MTH 132. It will prepare students for subsequent courses in trigonometry and calculus that use algebra.

Required Texts, Additional Reading, and Other Materials

Textbook: College Algebra with Integrated Review ISBN: 978-1-944894-97-9 (with textbook) or 978-1-944894-98-6 (with e-book only). The instructor does not recommend buying a physical textbook.

Activities Website: Free student account for Desmos.com website.

Calculator: TI-30 (TI-30X IIS recommended). Cell phone or smart device calculators are not permitted.

Internet Access: Students will need access to a computer and internet in order to complete Hawkes online homework, Desmos interactive activities, and other MUOnline/Blackboard assignments.

Course Student Learning Outcomes	How students will practice this outcome	How students will be assessed on this outcome
Identify and implement appropriate solution methods for single-variable equations	Online homework, written assignments, in-class activities	Course exams and common final
Identify and graph standard algebraic functions	Online homework, written assignments, in-class activities	Course exams and common final
Interpret graphs of functions	Online homework, written assignments, in-class activities	Course exams and common final
Construct functions to model applications	Online homework, written assignments, in-class activities	Course exams and common final
Communicate written mathematics using appropriate notation and explanation where appropriate	Online homework, written assignments, in-class activities	Course exams and common final

Attendance Policy

Attendance is required in the MWF portion of our course in order to complete the variety of in-class activities assigned each day. Attendance is also required on TR lab days to be able to complete in-lab activities. Only University Excused Absences will warrant makeup assignments or tests.

Tutoring

Free, drop-in tutoring is available in SH 625 after the first week of class. More information on this service can be found at http://www.marshall.edu/math/tutoring/.

Course Requirements / Due Dates

Students will utilize Hawkes Learning System (www.learn.hawkeslearning.com) for the **Learn and Practice** portion of each lesson, as well as Desmos (www.desmos.com) to complete **Activities** related to those lessons. Students will be assessed on their learning by completing **Certifications** (www.learn.hawkeslearning.com) in the Hawkes Learning System and taking **Tests** in class.

1) **Learning Activities:** The "activities" portion of the course will contain items from our MWF in-the-classroom experience like activities, challenge questions, quizzes, individual worksheets, lecture discussion, etc. All of these grades, including the Desmos Activities, will count toward the activities portion of your grade.

2) **Homework Certifications:** Each textbook section corresponds to at least one homework (Certify) section in the Hawkes learning system. Many assignments have prerequisite sections that must be completed prior to attempting the assignment. These prerequisites are review and reinforcement of mathematical topics that support the material you are learning in class. They are listed on the course schedule as "Prep work" and you should read through the "Learn" screens and attempt the assignments prior to the lab day for which they are assigned. **All assignments must be completed this semester, even if you have some certifications from previous semesters.**

3) **Tests:** There will be three midterm exams as outlined in the course schedule. Exam dates are January 31, February 28, and April 4.

4) **Common Final Exam:** The common final exam for MTH 127 will take place on **Saturday April 28** from 2-4 pm. You may use the required calculator for the course, but no other assistance (formula sheets, notebooks, phones, or other internet connected devices) will be permitted. **You must bring your own calculator or do without. There will be NO sharing of calculators permitted during the exam.**

Grading Policy

Activities make-up 15% and Certifications will be worth 20% of the semester grade. Each Unit Test (three total) will be worth 15% and the Comprehensive Final Exam (one exam) will be worth 20% of the semester grade.

Grade Calculation

Learning Activities	15%
Homework Certifications	20%
Tests (3 total)	45%
Common Final Exam	20%
Total	**100%**

Grade Scale

A = 90 – 100%
B = 80 – 89%
C = 70 – 79%
D = 60 – 69%
F = Below 60%

MTH 127 Spring 2018 Schedule (MWF Class, TR Labs)

Week 1 (1/8-1/12)	1	Introduction to the course **1.1 The Real Number System** 3: Inequalities 4: Set-builder and interval notation 5: Absolute value
	2	**Introduction to Hawkes:** **Prep Work 1.R.4** Simplifying Radicals **Learn, Practice, Certify 1.1** **Introduction to Desmos: Compound Inequalities**
	3	**3.1 Cartesian Coordinate System** 1: Cartesian coordinate system 2: The graph of an equation 3: Distance and midpoint formulas
	4	**Prep Work Due: 1.R.2** Reducing Fractions, **2.R.1** Multiplication and Division with Fractions, **2.R.2** Addition and Subtraction with Fractions **Lab: Practice and Certify 3.1** **Desmos: Pool Border Problem**
	5	**2.1a Linear Equations in One Variable** 1: Solutions to equations 2: Solving linear equations 4: Solving linear equations for one variable
Week 2 (1/15-1/19)	1	MLK Day
	2	**Prep Work Due: 4.R.1** Order of Operations **Lab: Practice and Certify 2.1a,b** **Desmos: The Coordinate Plane**
	3	**2.1b Applications of Linear Equations in One Variable** (Topic 5)
	4	**Prep Work Due: 4.R.2** Variables and Algebraic Expressions **Lab: Practice and Certify 2.2** **Desmos: Expression Mash-Up**
	5	**2.2 Linear Inequalities in One Variable** 1: Solving linear inequalities 2: Solving compound linear inequalities 4: Translating Inequality Phrases

Week 3 (1/22-1/26)	1	**3.2 Linear Equations in Two Variables** 1: Recognizing linear equations in two variables 2: x and y intercepts 3: Horizontal and vertical lines
	2	**Prep Work Due: 4.R.3** Simplifying Expressions **Lab: Practice and Certify 3.2** **Desmos: Connecting Graphs, Equations, and Tables**
	3	**3.3 Forms of Linear Equations** 1: The slope of a line 2: Slope-intercept form of a line 3: Point-slope form of a line
	4	**Practice with graphs of lines** **Lab: Practice and Certify 3.3** **Desmos: Polygraph: Lines**
	5	**3.4 Parallel and Perpendicular Lines** 1: Slopes of parallel lines 2: Slopes of perpendicular lines
Week 4 (1/29-2/2)	1	Review for Test 1
	2	**Review Activities: Test 1** **Desmos: Polygraph Lines, Part 2**
	3	Test 1
	4	**Prep Work: 5.R.1** Greatest Common Factor **Lab: Learn, Practice, Certify 5.R.2** Factoring Trinomials by Grouping **Desmos: Marbleslide: Lines**
	5	**2.3 Quadratic Equations in One Variable (Real Solutions Only)** 1: Solving quadratic equations by factoring 2: Solving "perfect square" quadratic equations
Week 5 (2/5-2/9)	1	**2.3 Quadratic Equations in One Variable (Real Solutions Only)** 1: Solving quadratic equations by factoring 2: Solving "perfect square" quadratic equations
	2	**Prep Work: 5.R.3** Additional Factoring Practice **Lab: Discuss Test 1** **Desmos: Picture Perfect**
	3	**1.6 The Complex Number System** 1: The imaginary unit and its properties 2: The algebra of complex numbers (no division) 3: Roots and complex numbers **2.3 Quadratic Equations in One Variable** 4: The quadratic formula
	4	**Prep Work: 1.5** Factoring Practice **Lab: Practice Factoring, Practice and Certify 1.6** **Desmos: Central Park**
	5	**2.3 Quadratic Equations in One Variable** 4: The quadratic formula

Week 6 (2/12-2/16)	1	**3.6 Introduction to Circles** 1: Standard form 2: Graphing circles (omit completing the square to write in standard form)
	2	**Lab: Practice and Certify 2.3 and 3.6** **Desmos: Function Carnival**
	3	**4.1 Relations and Functions** 1:Relations, domains, and ranges 2: Functions and the vertical line test
	4	**Prep Work: 4.R.4** Translating Phrases into Algebraic Expressions **Lab: Practice with Functions** **Desmos: Circle Patterns**
	5	**4.1 Relations and Functions** 3: Functional notation and evaluation 4: Implied domain of a function
Week 7 (2/19-2/23)	1	**4.2 Linear and Quadratic Functions** 1: Linear functions and graphs 2: Quadratic functions and graphs (Vertex form by formula, not completing the square)
	2	**Lab: Practice and Certify 4.1, 4.2a** **Desmos: Domain and Range Introduction**
	3	**4.2 Linear and Quadratic Functions** 3: Max/min problems
	4	**Lab: Practice and Certify 4.2b, 4.3a** **Desmos: Polygraph: Parabolas**
	5	**4.3a Other Common Functions** 1: Commonly occuring functions: ax^n, ax^(1/n), absolute value only **2.6 Radical Equations** 1: Solving radical equations (with only one radical expression)
Week 8 (2/26-3/2)	1	Review Test 2
	2	**Review activities Test 2** **Desmos: Polygraph: Power, Root, Absolute Value Functions**
	3	Test 2
	4	**Lab: Practice with graphing functions** **Desmos: Marbleslide: Parabolas**
	5	**4.4 Transformations of Functions** 1: Shifting and reflecting only
Week 9 (3/5-3/9)	1	**4.4 Transformations of Functions** 2: Symmetry of functions and equations 3: Intervals of monotonicity
	2	**Prep Work: 6.R.2** Special Products **Lab: Practice and Certify 4.4** **Desmos: What's My Transformation**
	3	**2.4 Higher Degree Polynomial Equations** 2: General polynomial equations of the form ax^n=b, or cubics that have a common factor of x only, real solutions only

	4	**Prep Work: 6.R.3** Special Factorizations - Squares **Lab: Practice and Certify 2.4** **Desmos: Card Sort: Transformations**
	5	**A.1 Polynomial Equations and Graphs (Text Section 5.1)** 1: Zeros of polynomials 2: Graphing factored polynomials **A.2 Polynomial Division and the Division Algorithm (Omit Division!) (Text Section 5.2)** 3: Constructing polynomials with given zeros
Week 10 (3/12-3/16)	1	**A.4 The Fundamental Theorem of Algebra (Text Section 5.4)** 1: The fundamental theorem of algebra 2: Multiple zeros and their geometric meaning
	2	**Prep Work: 6.R.1** Defining Rational Expressions **Lab: Practice and Certify A.1, A.2, A.4** **Desmos: Polygraph: Polynomial Pandemonium**
	3	**2.5 Rational Expressions and Equations** 1: Simplifying rational expressions 2: Combining rational expression 4: Solving rational equations
	4	**Lab: Practice and Certify 2.5** **Desmos: Constructing Polynomials**
	5	**6.1 Rational Functions** 1: Definitions 2: Vertical asymptotes
Week 11 (3/26-3/30)	1	**6.1 Rational Functions** 3: Horizontal asymptotes (no oblique) 4: Graphing rational functions
	2	**Lab: Practice and Certify 6.1** **Desmos: Polygraph: Rational Functions**
	3	**4.5 Combining Functions** 2: Composing functions
	4	**Lab: Practice and Certify 4.5** **Desmos: Marbleslide: Rationals**
	5	**4.6 Inverses of Functions** 2: Inverse functions and the horizontal line test 3: Finding inverse function formulas (basic only)
Week 12 (4/2-4/6)	1	Review for Test 3
	2	**Review Activities for Test 3** **Desmos: Inverse Functions**
	3	Test 3
	4	**Prep Work: 7.R.1** Simplifying Integer Exponents I **Lab: Learn, Practice, Certify 7.R.2** **Desmos: Avi and Benita's Repair Shop**
	5	**7.1 Exponential Functions and Their Graphs** 1: Definition 2: Graphing 3: Solving basic equations

Week 13 (4/9-4/13)	1	**Review 7.1** **7.2 Applications of Exponential Functions** 3: Compound interest
	2	**Prep Work: 7.R.3** Rational Exponents **Lab: Practice and Certify 7.1, 7.2** **Desmos: Polygraph: Exponentials**
	3	**7.3 Logarithmic Functions** 1: Definition of logarithmic functions 4: Common and Natural logarithms 2: Graphing logarithmic functions
	4	**Lab: Practice with logarithms** **Desmos: Marbleslide: Exponentials**
	5	**7.3 Logarithmic Functions** 3: Evaluating elementary logarithmic expressions
Week 14 (4/16-4/20)	1	**7.4 Properties of Logarithms** 1: Properties of logarithms 3: Applications (Richter Scale only)
	2	**Lab: Practice and Certify 7.3, 7.4** **Desmos: Polygraph: Exponential and Logarithmic Functions**
	3	**7.5 Exponential and Logarithmic Equations** 1: Converting between exponential and logarithmic forms
	4	**Lab: Practice solving exponential and logarithmic equations** **Desmos: What Comes Next?**
	5	**7.5 Exponential and Logarithmic Equations** 2: Further applications (Interest only)
Week 15 (4/23-4/27)	1	**8.1 Systems of Linear Equations** 1: Definition and classification 2: Solving by substitution 3: Solving by elimination (optional)
	2	**Prep Work: 8.R.1** Solving systems by graphing **Lab: Practice Solving Systems of Linear Equations** **Practice and Certify 7.5** **Desmos: System of Two Linear Equations**
	3	**8.1 Systems of Linear Equations** 2: Solving by substitution, applications 3: Solving by elimination (optional)
	4	**Review for Final Exam** **Desmos: Polygraph: Linear Systems**
	5	Review for Final Exam

The common final exam for MTH 127 will take place on Saturday, April 28 from 2-4 pm.