Marshall University
MTH 127 Sec 202: College Algebra
Spring 2018

Section/CRN	Section 202/CRN: 3913
Semester/Year	Spring 2018
Days/Time	MTWRF: 9-9:50am
Location	SH 518 MWF; SH 624 TR
Instructor	Dr. Michael Otunuga
Office	WAEC 3229
Office Hours	M-F 11-12pm, 1-2pm
Phone	304 696-3049
E-Mail	otunuga@marshall.edu
Webpage	http://science.marshall.edu/otunuga/
Free Tutoring	The math tutoring lab will be open this semester, starting the second week of classes, in Smith Hall 625. The hours are 10-4 and 5-6:30 MTWR and 10-noon Friday. Check the Math tutoring website at http://www.marshall.edu/math/tutoring/
Text	College Algebra with Integrated Review ISBN: 978-1-944894-97-9 (with textbook) or 978-1-944894-98-6 (with e-book only)
Calculator	TI-30 (any TI-30 is acceptable (TI-30X IIS recommended),TI-34 or 36 are not)
Prerequisites	Math ACT of 17 or above, SAT 400
Course Requirements	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 by completing **Certifications** (www.learn.hawkeslearning.com) in the Hawkes Learning System and taking **Tests** in class.
Course Description	Basic Concepts of algebra; Equations and Inequalities; Graphs; Study of Functions and their Graphs; Linear and Quadratic Functions; Polynomial and Rational Functions; Exponential and Logarithmic Functions
Course Objective	The students completing this course should be able to: - Understand mathematical concept of a function. - Sketch and interpret the graphs of elementary functions. - Manipulate and solve polynomial, rational, exponential, and logarithmic equations and apply to new situations in mathematics and daily life.
Homework	Homework will be assigned on Hawkes. **Certification:** Each textbook section corresponds to at least one homework (Certify) section in the Hawkes learning system. To sign in, go to **learn.hawkeslearning.com** and follow the onscreen prompts to enter your code.

	Activities: 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 they are assigned for.
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be 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 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 See the University Academic Calendar (http://www.marshall.edu/calendar/academic/) for course withdrawal dates.
Disable Student	**Policy for Students with Disabilities:** Marshall University is committed to equal opportunity education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disability Services (ODS) in Prichard Hall 117 (304.696.2467) to provide documentation of their disability. Following this, the ODS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experience, outside assignment, testing, and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, access the website for the Office of Disabled Student Services: http://www.marshall.edu/disabled.

How each student learning outcome will be practiced and assessed in the course

MTH 127 Student Learning Outcomes	How students will practice each outcome in MTH 127	How student achievement will be assessed
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:

1. Students should come on time and stay in the class for entire class. If you are late by more than 5 minutes, you will be considered to be absent.
2. Attendance is required and you must come with your text. Attendance will be taken every class day.
3. Unexcused absences from **5** classes (equivalent of one-week unexcused absence) will result in a reduction of one letter grade for the semester; unexcused absences from **6 or more** classes will result in an F
4. Absences which can be excused include illness, emergencies, or participation in another university activity
5. **All assignments must be completed this semester, even if you have some certifications from previous semesters.**

Tests: There will be three midterm exams as outlined in the course schedule. Exam dates are **January 31, February 28, and April 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 (TI-30), 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

Attendance & Activities:	15%	**Scale**	
Homework (Hawkes):	20%	90.00 – 100%	A
Exam 1:	15%	80.00 – 89.99%	B
Exam 2:	15%	70.00 – 79.99%	C
Exam 3:	15%	60.00 – 69.99%	D
Final:	20%	Below 60.00%	F

Course Content:

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	Pg. 12 # 5-25, 32-40, 41-52
	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	Pg. 185-187 #1-26, 33-51, 54, 55-60, 69-73
	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	Pg 106-108 #1-25
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)	Pg. 108-110 #47-56, 61,65-67, 69, 72
	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	Pg. 118-119 #1-33, 49-57, 59

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	Pg 194-196 # 1-48
	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	Pg. 209-210 #1-12, 13- 21, 25-28, 34-67
	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	Pg. 219-221#1-6, 19-21, 29-33, 39-41, 55-66
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	Pg. 132-133 #1-8, 15-19
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	Pg. 132-133 #9-13, 21-23
	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	Pg. 83-84 # 1-21, 42, 43 Pg. 133 #34-60
	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	Pg. 133 #34-60
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)	Pg. 239-241 #1-24, 25-29, 30-39
	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	Pg 266-268 #1,2,4,9,10,12,13,14,17-20,25-31,35
	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	Pg. 268-269 #43-46, 49, 61,63, 66,67,68
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)	Pg. 281 #1-5, 8, 16, 17, 19-21, 31-37
	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	Pg 281-285 # 39, 41, 42, 47, 49-53
	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)	Pg.299 # 1-8, 13-18, 37-40 Pg. 162 #1,4,5,6,10,13,14, 16, 34-41
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	Pg. 317-318 # 1-3, 8, 9-12, 13-21, 36-45
Week 9 (3/5-3/9)	1	**4.4 Transformations of Functions** 2: Symmetry of functions and equations 3: Intervals of monotonicity	Pg. 319 # 46-54, 61-66
	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	Pg. 141 # 21, 28, 29, 30
	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	Pg. 372-373 #1, 5, 6, 8, 9, 18-21, 24, 27,28, 36-41, 42-49 Pg. 388 #53, 57, 58
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	Pg. 415 #1-8, 39, 42, 44
	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	Pg. 152-154 #1-6, 13,14,17,23,24,25,27, 49, 50, 52, 54,55
	4	**Lab: Practice and Certify 2.5** **Desmos: Constructing Polynomials**	
	5	**6.1 Rational Functions** 1: Definitions 2: Vertical asymptotes	Pg. 443 # 1-11, 69
Spring Break			
Week 11 (3/26-3/30)	1	**6.1 Rational Functions** 3: Horizontal asymptotes (no oblique) 4: Graphing rational functions	Pg. 444-445 #19, 22, 23, 24, 25, 29, 31, 34, 37, 40, 41, 42, 43, 47, 49-52
	2	**Lab: Practice and Certify 6.1** **Desmos: Polygraph: Rational Functions**	
	3	**4.5 Combining Functions** 2: Composing functions	Pg. 331 #23-27,31-37, 44-46
	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)	Pg: 345-346 #13-16, 17-22, 30,35,36,39,47,49,51,53
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	Pg. 514-515 # 1-6, 22-38, 49, 51, 52, 53, 55, 57
Week 13 (4/9-4/13)	1	**Review 7.1** **7.2 Applications of Exponential Functions** 3: Compound interest	Pg. 530-531 #22,23,25,26,27,28,29,32,33

	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	Pg. 541-543 #1-8, 13-20, 25,26,31,37-45, 73-77
	4	**Lab: Practice with logarithms** **Desmos: Marbleslide: Exponentials**	
	5	**7.3 Logarithmic Functions** 3: Evaluating elementary logarithmic expressions	Pg. 543 #46-54, 61-64
Week 14 (4/16-4/20)	1	**7.4 Properties of Logarithms** 1: Properties of logarithms 3: Applications (Richter Scale only)	Pg. 555-557 #1-6, 19-26, 31-36,97, 98,
	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	Pg. 571-572 #1-12, 25-33,49-53
	4	**Lab: Practice solving exponential and logarithmic equations** **Desmos: What Comes Next?**	
	5	**7.5 Exponential and Logarithmic Equations** 2: Further applications (Interest only)	Pg. 573-574 #75, 79, 80
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)	Pg. 601 #1-15
	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)	Pg. 603-604 #58, 63, 64, 65, 70
	4	**Review for Final Exam** **Desmos: Polygraph: Linear Systems**	
	5	Review for Final Exam	