Marshall University Syllabus
MTH 127: College Algebra Expanded
Fall 2017

Instructor: Laura Stapleton

Section/CRN: Section 115 CRN: 3134

Meeting Location/Times: Class: 2:00 – 2:50 TRF; Lab: 2:00 – 2:50 MW

Office Hours: 11:00 – 2:00 TR

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. 5 hours. **(PR:** Math ACT 17-20, or MTH 099, or MTH 102/102B)

Required Texts, Additional Reading, and Other Materials

1. College Algebra with Integrated Review ISBN:978-1-944894-97-9 (with textbook) or 978-1-944894-98-6 (with e-book only)
2. Students will be required to use a **computer** to access Hawkes and communicate with the instructor outside of class. Many computer labs are located around campus.
3. Students are required to have a **calculator** for the course. **Required Calculator:** TI-30 (any of the TI-30 family is acceptable, but TI-34 or 36 are not). No graphing calculators!
4. Students should keep a **notebook** of all class notes, written homework assignments, etc. and collect handouts, worksheets, quizzes, and tests.

University Policies: http://www.marshall.edu/academic-affairs/?page_id=802

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

Hawkes Mastery-based Homework and Webtests: 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.

All Hawkes material must be completed by the due date that is listed in Hawkes. Any material submitted after the due date will be given a grade of zero. The lowest five grades will be dropped at the end of the semester. If you fail to complete a Hawkes homework by the due date, you are still responsible for the material and must complete it in order to be prepared for the tests and final exam.

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.

All assignments must be completed this semester, even if you have some certifications from previous semesters.

Course Requirements / Due Dates

1. **Activities and Exercises** – Outside-of-class, students will prepare for class by reading the appropriate section(s) from the textbook. In-class, they will complete worksheets, problems of the day, activities, or other assignments that promote discovery and practice of the concepts covered in lesson. See the Course Schedule for approximate lesson coverage dates. Due dates will be announced in class.
2. **Exams:** There will be three exams as outlined in the course schedule. Exam dates are September 12, October 10, and November 7.
3. **Common Final Examination** – The common final exam for MTH 127 will take place on **Saturday December 9** 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 Policies:

A student's final letter grade will be determined by the following scale.

90.00 - 100%	**A**
80.00 – 89.99%	**B**
70.00 – 79.99%	**C**
60.00 – 69.99%	**D**
Below 60.00%	**F**

Hawkes (common homework)	20%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Common Final Exam	20%
In-Class Assignments	10%

Attendance	5%
Total	**100%**

Students must take the MTH 127 Comprehensive Final Examination in order to complete the class and receive a letter grade. The exam is scheduled for Saturday, December 9th, 2017 at 2:00 pm – 4:00 pm.

Attendance Policy

Students are expected to attend each class/lab. Attendance is taken by a daily "sign-in" sheet. If you do not sign, then you will be counted as absent; and this "absence" cannot be corrected after the class has dispersed for the day. Students must be present the entire class/lab to be counted. You are expected to participate in class discussions and activities**. Attendance in lab is based on students attending the entire lab, be making progress on the assignments (prep work due), and completion of Desmos activity, if applicable.**

Students who miss one or two class periods can turn in the excuse directly to their instructor. If the absence is 3 or more days, please go to the Dean of Students' Office in the MSC. Students must notify the instructor by phone or e-mail prior to an exam if they cannot take a scheduled exam. Students must present a serious reason for missing any exam (illness with a doctor's excuse, death in the family, university excused absence, etc.). Makeup exams will be given to students who have an excused absence for a test either outside of class time or during the last week of the semester at the convenience of the instructor. Excessive use of cell phone or sleeping during class will be counted as an unexcused absence. Students who are frequently tardy or leave class early will also receive an unexcused absence.

Tutoring Facilities

- The Department of Mathematics offers a free tutoring lab for Marshall students enrolled in mathematics courses. The tutors can help with all classes up to MTH 231. No appointment is necessary; just stop in and ask for a tutor. The lab location and tutoring hours are:

  Smith Hall 625: Monday through Thursday - 10am to 4pm and 5:00pm to 6:30pm. Friday - 10am to noon. The lab will open on the second week of classes, beginning August 28 and running through the end of the semester. **The lab is not open during finals week.**

- The University College Tutoring Center in the Communications Building (second floor Smith Hall) has tutors who are available for free, by appointment. Additional information can be found at http://www.marshall.edu/wpmu/uc/tutoring-services

MTH 127 Course Schedule – Fall 2017 (Subject to Change)

Week	Dates	Material Needed, To be Covered	Recommend Problems
Week 1	**M: 8/21**	**Course Introduction**	
	T: 8/22	**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
	W: 8/23	**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 1.1** **Desmos: Pool Border Problem**	
	R: 8/24	**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
	F: 8/25	**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	**M: 8/28**	**Prep Work Due: 4.R.1 Order of Operations** **Lab: Practice and Certify 3.1, 2.1a** **Desmos: The Coordinate Plane**	
	T: 8/29	**2.1b Applications of Linear Equations in One Variable** (Topic 5)	Pg. 108-110 #47-56, 61,65-67, 69, 72
	W: 8/30	**Prep Work Due: 4.R.2** Variables and Algebraic Expressions **Lab: Practice and Certify 2.1a,b** **Desmos: Expression Mash-Up**	
	R: 8/3	**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
	F: 9/1	**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
Week 3	**M: 9/4**	**No Class – Labor Day**	
	T: 9/5	**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
	W: 9/6	**Prep Work Due: 4.R.3** Simplifying Expressions **Lab: Practice and Certify 2.2, 3.2, 3.3** **Desmos: Connecting Graphs, Equations, and Tables**	
	R: 9/7	**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
	F: 9/8	Review for Test 1	

Week 4	**M: 9/11**	**Review Activities: Test 1** **Desmos: Polygraph: Lines**	
	T: 9/12	Test 1	
	W: 9/13	**Prep Work: 5.R.1** Greatest Common Factor **Lab: Learn, Practice, Certify 5.R.2** Factoring Trinomials by Grouping **Desmos: Marbleslide: Lines**	
	R: 9/14	**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
	F: 9/15	**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
Week 5	**M: 9/18**	**Prep Work: 5.R.3** Additional Factoring Practice **Lab: Discuss Test 1** **Desmos: Picture Perfect**	
	T: 9/19	**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	Pg. 83-84 # 1-21, 42, 43
	W: 9/20	**Prep Work: 1.5** Factoring Practice **Lab: Practice Factoring, Practice and Certify 1.6** **Desmos: Central Park**	
	R: 9/21	**2.3 Quadratic Equations in One Variable** 4: The quadratic formula	Pg. 133 #34-60
	F: 9/22	**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
Week 6	**M: 9/25**	**Lab: Practice and Certify 2.3 and 3.6** **Desmos: Function Carnival**	
	T: 9/26	**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
	W: 9/27	**Prep Work: 4.R.4** Translating Phrases into Algebraic Expressions **Lab: Practice with Functions** **Desmos: Circle Patterns**	
	R: 9/28	**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
	F: 9/29	**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

Week 7	**M: 10/2**	**Prep Work 1.R.4** Simplifying Radicals **Lab: Practice and Certify 4.1, 4.2a** **Desmos: Domain and Range Introduction**	
	T: 10/3	**4.2 Linear and Quadratic Functions** 3: Max/min problems **4.3a Other Common Functions** 1: Commonly occuring functions: ax^n, ax^(1/n), absolute value only	Pg 281-285 # 39, 41, 42, 47, 49-53 Pg.299 # 1-8, 13-18, 37-40
	W: 10/4	**Lab: Practice and Certify 4.2b, 4.3a** **Desmos: Polygraph: Parabolas**	
	R: 10/5	**2.6 Radical Equations** 1: Solving radical equations (with only one radical expression)	Pg. 162 #1,4,5,6,10,13,14, 16, 34-41
	F: 10/6	Review Test 2	
Week 8	**M: 10/9**	**Review activities Test 2** **Desmos: Polygraph: Power, Root, Absolute Value Functions**	
	T: 10/10	Test 2	
	W: 10/11	**Lab: Practice with graphing functions** **Desmos: Marbleslide: Parabolas**	
	R: 10/12	**4.4 Transformations of Functions** 1: Shifting and reflecting only	Pg. 317-318 # 1-3, 8, 9-12, 13-21, 36-45
	F: 10/13	**4.4 Transformations of Functions** 2: Symmetry of functions and equations 3: Intervals of monotonicity	Pg. 319 # 46-54, 61-66
Week 9	**M: 10/16**	**Prep Work: 6.R.2** Special Products **Lab: Practice and Certify 4.4** **Desmos: What's My Transformation**	
	T: 10/17	**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	
	W: 10/18	**Prep Work: 6.R.3** Special Factorizations - Squares **Lab: Practice and Certify 2.4** **Desmos: Card Sort: Transformations**	
	R: 10/19	**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
	F: 10/20	**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

Week 10	**M: 10/23**	**Prep Work: 6.R.1** Defining Rational Expressions **Lab: Practice and Certify A.1, A.2, A.4** **Desmos: Polygraph: Polynomial Pandemonium**	
	T: 10/24	**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
	W: 10/25	**Lab: Practice and Certify 2.5** **Desmos: Constructing Polynomials**	
	R: 10/26	**6.1 Rational Functions** 1: Definitions 2: Vertical asymptotes	Pg. 443 # 1-11, 69
	F: 10/27	**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
Week 11	**M: 10/30**	**Lab: Practice and Certify 6.1** **Desmos: Polygraph: Rational Functions**	
	T: 10/31	**4.5 Combining Functions** 2: Composing functions	Pg. 331 #23-27,31-37, 44-46
	W: 11/1	**Lab: Practice and Certify 4.5** **Desmos: Marbleslide: Rationals**	
	R: 11/2	**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
	F: 11/3	Review for Test 3	
Week 12	**M: 11/6**	**Review Activities for Test 3** **Desmos: Inverse Functions**	
	T: 11/7	Test 3	
	W: 11/8	**Prep Work: 7.R.1** Simplifying Integer Exponents I **Lab: Learn, Practice, Certify 7.R.2** **Desmos: Avi and Benita's Repair Shop**	
	R: 11/9	**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
	F: 11/10	**Review 7.1** **7.2 Applications of Exponential Functions** 3: Compound interest	Pg. 530-531 #22,23,25,26,27,28,29,32,33
Week 13	**M: 11/13**	**Prep Work: 7.R.3** Rational Exponents **Lab: Practice and Certify 7.1, 7.2** **Desmos: Polygraph: Exponentials**	
	T: 11/14	**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
	W: 11/15	**Lab: Practice with logarithms** **Desmos: Marbleslide: Exponentials**	

	R: 11/16	**7.3 Logarithmic Functions** 3: Evaluating elementary logarithmic expressions	Pg. 543 #46-54, 61-64
	F: 11/17	**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,
Week 14	THANKSGIVING BREAK		
Week 15	**M: 11/27**	**Lab: Practice and Certify 7.3, 7.4** **Desmos: Polygraph: Exponential and Logarithmic Functions**	
	T: 11/28	**7.5 Exponential and Logarithmic Equations** 1: Converting between exponential and logarithmic forms	Pg. 571-572 #1-12, 25-33,49-53
	W: 11/29	**Lab: Practice solving exponential and logarithmic equations** **Desmos: What Comes Next?**	
	R: 11/30	**7.5 Exponential and Logarithmic Equations** 2: Further applications (Interest only)	Pg. 573-574 #75, 79, 80
	F: 12/1	**8.1 Systems of Linear Equations** 1: Definition and classification 2: Solving by substitution	Pg. 601 #1-15
Week 16	**M: 12/4**	**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**	
	T: 12/5	**8.1 Systems of Linear Equations** 2: Solving by substitution, applications	Pg. 603-604 #58, 63, 64, 65, 70
	W: 12/6	**Review for Final Exam** **Desmos: Polygraph: Linear Systems**	
	R: 12/7	Review for Final Exam	
	F: 12/8	Review for Final Exam	