



Marshall University
College of Science
School of Mathematics and Informatics
MTH 130 Syllabus

Course

MTH 130 – College Algebra – Section 103 CRN 2995

Course Description

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

Credits

3 credit hours

Prerequisites

ACT Math 21 or New SAT Math 530 or Old SAT MATH 500 or above.

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

Term/Year

Fall 2018

Class Meeting Days/Times

8:00 – 8:50 MWF

Location

SH 516

Academic Calendar

For beginning, ending, and add/drop dates, see the [Marshall University Academic Calendar](http://www.marshall.edu/calendar/academic) (URL: <http://www.marshall.edu/calendar/academic>).

Instructor

Rob-Roy Mace

Contact Information

Office: SH 743E

Office Hours: T&R 8:00am – 9:00am, MTW 1:00pm - 2:00pm

Office Phone: (304)696-7040

Marshall Email: mace22@marshall.edu

Required Texts, Additional Reading, and Other Materials

1. Textbook: College Algebra with Integrated Review ISBN: 9781941552407
978-1-944894-97-9 (with textbook) or 978194155274 (with e-book only)

NOTE: The instructor recommends buying e-book only, which comes with the purchased access to the required online homework system Hawkes, and can be done within 2 weeks of enrolling in the program.

2. Required Calculator: TI-30 (any TI-30 is acceptable (TI-30X IIS recommended), TI-34 or 36 are not)

3. Access to a computer with internet service to complete various homework assignments and receive instructor messages throughout the semester.

NOTE: There are a variety of computer labs around campus, as well as laptops and iPads available to check out at the Drinko Library.

4. Pencils, paper, or some similar system that allows the student to take notes from lecture or to complete various in-class writing assignments.

Course Student Learning Outcomes

The table below shows the following relationships:

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Identify and implement appropriate solution methods for single-variable equations	Hawkes lessons, Desmos activities, In-Class Activities	Hawkes Certifications, Desmos Submissions, Module Tests, and Final Exam

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Identify and graph standard algebraic functions	Hawkes lessons, Desmos activities, In-Class Activities	Hawkes Certifications, Desmos Submissions, Module Tests, and Final Exam
Interpret graphs of functions	Hawkes lessons, Desmos activities, In-Class Activities	Hawkes Certifications, Desmos Submissions, Module Tests, and Final Exam
Construct functions to model applications	Hawkes lessons, Desmos activities, In-Class Activities	Hawkes Certifications, Desmos Submissions, Module Tests, and Final Exam

Course Requirements/Due Dates

Hawkes Mastery-based Homework: 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.

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.

Exams: There will be three midterm exams as outlined in the course schedule. Exam dates are September 12, October 10, and November 7.

Common Final Exam: The common final exam for MTH 130 will take place on **Saturday December 8** 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:

Hawkes (common homework)	15%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Common Final Exam	20%
Other (Instructor's choice)	20%

MTH 130 Fall 2018 Schedule (Tentative)

Week 1	1	Introduction to the course 1.1 The Real Number System 3: Inequalities 4: Set-builder and interval notation 5: Absolute value
	3	3.1 Cartesian Coordinate System 1: Cartesian coordinate system 2: The graph of an equation 3: Distance and midpoint formulas
	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	2.1b Applications of Linear Equations in One Variable (Topic 5)
	3	2.2 Linear Inequalities in One Variable 1: Solving linear inequalities 2: Solving compound linear inequalities 4: Translating Inequality Phrases
	5	3.2 Linear Equations in Two Variables 1: Recognizing linear equations in two variables 2: x and y intercepts 3: Horizontal and vertical lines
Week 3	1	Labor Day
	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

	5	3.4 Parallel and Perpendicular Lines 1: Slopes of parallel lines 2: Slopes of perpendicular lines
Week 4	1	Review for Test 1
	3	Test 1
	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	1	2.3 Quadratic Equations in One Variable (Real Solutions Only) 1: Solving quadratic equations by factoring 2: Solving "perfect square" quadratic equations
	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
	5	2.3 Quadratic Equations in One Variable 4: The quadratic formula
Week 6	1	3.6 Introduction to Circles 1: Standard form 2: Graphing circles (omit completing the square to write in standard form)
	3	4.1 Relations and Functions 1: Relations, domains, and ranges 2: Functions and the vertical line test
	5	4.1 Relations and Functions 3: Functional notation and evaluation 4: Implied domain of a function
Week 7	1	4.2a Linear and Quadratic Functions 1: Linear functions and graphs 2: Quadratic functions and graphs (Vertex form by formula, not completing the square)
	3	4.2b Linear and Quadratic Functions 3: Max/min problems

	5	4.3a Other Common Functions 1: Commonly occurring functions: ax^n , $ax^{(1/n)}$, absolute value only 2.6 Radical Equations 1: Solving radical equations (with only one radical expression)
Week 8	1	Review Test 2
	3	Test 2
	5	4.4 Transformations of Functions 1: Shifting and reflecting only
Week 9	1	4.4 Transformations of Functions 2: Symmetry of functions and equations 3: Intervals of monotonicity
	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
	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	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
	3	2.5 Rational Expressions and Equations 1: Simplifying rational expressions 2: Combining rational expression 4: Solving rational equations
	5	6.1 Rational Functions 1: Definitions 2: Vertical asymptotes
Week 11	1	6.1 Rational Functions 3: Horizontal asymptotes (no oblique) 4: Graphing rational functions
	3	4.5 Combining Functions 2: Composing functions
	5	4.6 Inverses of Functions 2: Inverse functions and the horizontal line test 3: Finding inverse function formulas (basic only)
Week 12	1	Review for Test 3

	3	Test 3
	5	7.1 Exponential Functions and Their Graphs 1: Definition 2: Graphing 3: Solving basic equations
Week 13	1	Review 7.1 7.2 Applications of Exponential Functions 3: Compound interest
	3	7.3 Logarithmic Functions 1: Definition of logarithmic functions 4: Common and Natural logarithms 2: Graphing logarithmic functions
	5	7.3 Logarithmic Functions 3: Evaluating elementary logarithmic expressions
Week 14	1	7.4 Properties of Logarithms 1: Properties of logarithms 3: Applications (Richter Scale only)
	3	7.5 Exponential and Logarithmic Equations 1: Converting between exponential and logarithmic forms
	5	7.5 Exponential and Logarithmic Equations 2: Further applications (Interest only)
Week 15	1	8.1 Systems of Linear Equations 1: Definition and classification 2: Solving by substitution
	3	8.1 Systems of Linear Equations 2: Solving by substitution, applications
	5	Review for Final Exam