**Marshall University Syllabus**

**MTH 130: College Algebra**

**Fall 2017**

**Instructor: Rob-Roy Mace**

**Section/CRN: 101/3141**

**Meeting Location/Times: Smith Hall 516**

**MWF 8 – 8:50 am**

**Office Hours: MTW 11 – Noon and Tues. 1 – 4 pm in Smith Hall 743E**

**Instructor e-mail: mace22@marshall.edu**

**Textbook:** College Algebra, 2nd Ed. by Sisson, ISBN: 978-1-941552-40-7 (with textbook) or 978-1-941552-74-2 (with e-book only)

**Required Calculator:** TI-30 (any of the TI-30 family is acceptable, but TI-34 or 36 are not)

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

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| **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 |

# 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

**Exams:** There will be three midterm exams as outlined in the course schedule. Exam dates are September 13, October 11, and November 8.

**Common Final Exam:** The common final exam for MTH 127/130 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.**

**Attendance Policy: Attendance** **is required and will be recorded with the University**. Consult your handbook regarding university excused absences. You must be in class to take quizzes or exams, turn in homework, etc. If an excused absence results in missing quiz/exam/hw, then a make-up date (*within one week of absence*) must be scheduled with course instructor.

**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.

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.**

**Grading Policies:**

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

**Grade Scale**: A: 100-90%

B: 89-80%

C: 79-70%

D: 69-60%

F: 59-0%

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| **MTH 130 Fall 2017 Tentative Schedule** | | |
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| Week 1 8/21-8/25 | 1 | Introduction to the course  **1.1 The Real Number System** 3: Inequalities 4: Set-builder and interval notation 5: Absolute value |
| 2 | **3.1 Cartesian Coordinate System** 1: Cartesian coordinate system 2: The graph of an equation 3: Distance and midpoint formulas |
| 3 | **2.1a Linear Equations in One Variable** 1: Solutions to equations 2: Solving linear equations 4: Solving linear equations for one variable |
| Week 2 8/28-9/1 | 1 | **2.1b Applications of Linear Equations in One Variable** (Topic 5) |
| 2 | **2.2 Linear Inequalities in One Variable** 1: Solving linear inequalities 2: Solving compound linear inequalities 4: Translating Inequality Phrases |
| 3 | **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 9/4-9/8 | 1 | Labor Day |
| 2 | **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 |
| 3 | **3.4 Parallel and Perpendicular Lines** 1: Slopes of parallel lines 2: Slopes of perpendicular lines |
| Week 4 9/11-9/15 | 1 | Review for Test 1 |
| 2 | Test 1 |
| 3 | **2.3 Quadratic Equations in One Variable (Real Solutions Only)** 1: Solving quadratic equations by factoring 2: Solving "perfect square" quadratic equations |
| Week 5 9/18-9/22 | 1 | **2.3 Quadratic Equations in One Variable (Real Solutions Only)** 1: Solving quadratic equations by factoring 2: Solving "perfect square" quadratic equations |
| 2 | **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 |
| 3 | **2.3 Quadratic Equations in One Variable (Real and Complex Solutions)** 4: The quadratic formula |
| Week 6 9/25-9/29 | 1 | **3.6 Introduction to Circles** 1: Standard form  2: Graphing circles (omit completing the square to write in standard form) |
| 2 | **4.1 Relations and Functions** 1:Relations, domains, and ranges 2: Functions and the vertical line test |
| 3 | **4.1 Relations and Functions** 3: Functional notation and evaluation 4: Implied domain of a function |
| Week 7 10/2-10/6 | 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 | **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 |
| 3 | **2.6 Radical Equations** 1: Solving radical equations (with only one radical expression) |
| Week 8 10/9-10/13 | 1 | Review Test 2 |
| 2 | Test 2 |
| 3 | **4.4 Transformations of Functions** 1: Shifting and reflecting only |
| Week 9 10/16-10/20 | 1 | **4.4 Transformations of Functions** 2: Symmetry of functions and equations 3: Intervals of monotonicity |
| 2 | **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 |
| 3 | **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 10/23-10/27 | 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 | **2.5 Rational Expressions and Equations** 1: Simplifying rational expressions 2: Combining rational expression 4: Solving rational equations |
| 3 | **6.1 Rational Functions** 1: Definitions 2: Vertical asymptotes |
| Week 11 10/30-11/3 | 1 | **6.1 Rational Functions** 3: Horizontal asymptotes (no oblique) 4: Graphing rational functions |
| 2 | **4.5 Combining Functions** 2: Composing functions |
| 3 | **4.6 Inverses of Functions** 2: Inverse functions and the horizontal line test 3: Finding inverse function formulas (basic only) |
| Week 12 11/6-11/10 | 1 | Review for Test 3 |
| 2 | Test 3 |
| 3 | **7.1 Exponential Functions and Their Graphs** 1: Definition  2: Graphing 3: Solving basic equations |
| Week 13 11/13-11/17 | 1 | **Review 7.1 7.2 Applications of Exponential Functions** 3: Compound interest |
| 2 | **7.3 Logarithmic Functions** 1: Definition of logarithmic functions 4: Common and Natural logarithms 2: Graphing logarithmic functions |
| 3 | **7.3 Logarithmic Functions** 3: Evaluating elementary logarithmic expressions |
| Week 14 11/27-12/1 | 1 | **7.4 Properties of Logarithms** 1: Properties of logarithms 3: Applications (Richter Scale only) |
| 2 | **7.5 Exponential and Logarithmic Equations** 1: Converting between exponential and logarithmic forms |
| 3 | **7.5 Exponential and Logarithmic Equations** 2: Further applications (Interest only) |
| Week 15 12/4-12/8 | 1 | **8.1 Systems of Linear Equations** 1: Definition and classification 2: Solving by substitution |
| 2 | **8.1 Systems of Linear Equations** 2: Solving by substitution, applications |
| 3 | Review for Final Exam |