

MATH 111 – College Algebra COURSE SYLLABUS · FALL 2018

INSTRUCTOR:	Roger Griffiths	OFFICE HOURS:	
OFFICE:	Old Main 305	Mon: 09:00 - 09:50	
EMAIL:	rgriffiths@mercyhurst.edu	Tues: 08:50 - 09:20	
PHONE:	824-2123	(in Hirt M207)	
CLASS TIME:	Mon, Wed, Fri: 12:00 - 12:50, (3 semester credits)	Tues: 12:00 - 12:50	
LOCATION:	Hirt M207	Tues: 3:00 - 3:50	
PREREQUISITE:	Math Placement (ALEKS) Score 46 or higher	Thur: 08:00 - 09:20	
WEB:	http://math.mercyhurst.edu/~griff/courses/m111/	(in Hirt M207)	
TEXT:	<i>Intermediate Algebra for College Students</i> , (7th Edition) by Robert Blitzer	Thur: 2:00 - 2:50	

WHY UNDERSTANDING MATHEMATICS IS ESSENTIAL

If one does not understand or refuses to deal with mathematics, one has fatally impaired one's ability to comprehend the natural sciences, because not only are the ideas of the natural sciences expressed in mathematical form, but also the relationships among those ideas are established with mathematical reasoning.

It's Time To Start...Ready...Go!

COURSE CONTENT

This is a course in algebra, similar to high school courses in algebra except that the pace will be faster. We will begin with some review of real-number concepts, and proceed into linear equations in one variable, mathematical modeling, polynomials, rational expressions, functions, lines, exponents, and radicals, equations, inequalities, and polynomial and rational functions.

Prerequisite: MATH Placement score of at least 46.

LEARNING OBJECTIVES

By the end of this course, you will have acquired many mathematical tools which include the ability to:

- Identify, distinguish, perform algebraic operations and find solutions to equations using the integer, rational, real and complex number systems.
- Use common algebraic methods to solve linear, quadratic, polynomial, radical, and absolute value equations and inequalities.
- Translate the written problem and create algebraic models to solve real-life problems.
- Use and create algebraic functions.
- Demonstrate your understanding of introductory language of mathematics through the use of proper mathematics notation.

TEXTBOOK

Intermediate Algebra for College Students, 7th Edition, by Robert Blitzer. You will need this textbook, and be sure to check the edition when purchasing your textbook; other editions have similar material, but the assigned problems may be different. No other materials are required for this class. You do NOT need to purchase a subscription to MyMathLab or pay to access any other online resources. If you prefer to purchase an electronic version of the text, you're welcome to do so.

CALCULATORS

Calculators are not required or even recommended for this course, and **you will not be permitted to use a calculator or computer on any quiz or exam.**

You are strongly encouraged to avoid using a calculator while working on homework. *All of our examinations are carefully designed to be taken "closed book" without the use of calculators, computers or "crib sheets".* Examination problems will focus on the basic formulas and problem solving techniques which every college graduate should know without a calculator or textbook. We will be interested in learning the process and writing mathematics, not necessarily in answers.

HOMEWORK

I do not collect or grade your written homework. You will be held accountable for the mastery of homework problems via the quizzes (which can occur any day). As such, you get no credit for *merely attempting the homework*, your goal is to master each type of problem assigned.

HOMEWORK SUGGESTIONS

- The textbook exercises typically begin with several groups of problems that cover small pieces of the material covered in that section. The exercises near the end of that section often put those ideas all together, necessitating mastery of the low-numbered exercises before attempting the latter. However, working only the low-numbered exercises will not prepare a student sufficiently for the quizzes or exams.
- Most of science and mathematics (and, I believe most endeavors) is learning how to recover from little failures (our mistakes, incorrect assumptions, crashes, etc), until at last we succeed. Any endeavor worth doing takes much practice to become proficient. Think about snowboarding, the violin, chess, ice hockey, and so on; you can practice for years and continue to get better, learn new tricks, reach the next level of proficiency. People work that hard for the love of their sport, hobby, or profession. Mathematics as an art is no different. Although, most of you will probably always view mathematics as a tool or possibly the language of science. But most of the modern world is built on the back of that science and engineering, which is built on mathematics. It is for that reason that you should be willing to expend the necessary effort, work through your frustrations and failures, and, in the end, achieve success in this, and subsequent mathematics courses.
- **Homework is far and away the single most important part of any mathematics course** because this is when most (all) of the learning takes place. Homework problems will be assigned regularly and I expect you to do them. If you are unable to do a problem I expect you to find out how to do it. You have at your disposal several means of meeting this expectation.
 - You can stick with it until you figure it out yourself.
 - You can discuss the problem with a classmate or several classmates (strongly encouraged).
 - You can work through the problem with one of the mathematics tutors available for this course; see: <http://math.mercyhurst.edu/Tutoring/> for more information.
 - You can ask me about the problem in class (time permitting).
 - You can see me individually during my office hours. I am always happy to talk to you during my office hours or at any other time if not otherwise committed; when coming to my office, be prepared to show me what you've already tried.
 - You can discuss the problem with anyone who can and is willing to help you.
- In studying mathematics, you must be careful not to let a tutor or friend *think* for you. It is essential that you can work problems **completely on your own, without help from any resource**, by the time of a quiz or exam.
- Simply ignoring a problem that you are unable to solve is not **acceptable**.

- You should continue to work problems of a given type (even beyond the assigned problems) until you see the pattern yourself, without assistance of any type (i.e. without using your notes, worked examples, or any prior problems).
- Attending every class is not enough; mathematics can only be learned through practice (like anything worth mastering).
- Remember, the general rule of thumb for a college level class is that one should put in at least 2 hours of work outside class for every hour in class. This means that you should be working on this course for about 6 hours a week outside of class.

EVALUATION

Your letter grade in this course will be based on:

- 100 points: **Quizzes** Quiz average out of 100 points, will drop 1 quiz score
- 400 points: **Exams:** 4 exams at 100 points each
- 200 points: **Final Exam** Comprehensive Final exam worth 200 points
- 700 points: **Total points** in the course

And assigned according to the following scale:

Total Class Points	Percent %	Letter Grade	Interpretation
630 - 700	90 to 100	A	Exceptional
609 - 629	87 to 89	B+	Outstanding
560 - 608	80 to 86	B	Very Good
539 - 559	77 to 79	C+	Good
490 - 538	70 to 76	C	Satisfactory
420 - 489	60 to 69	D	Unsatisfactory
0 - 419	Below 60	F	Failure

- ✓ Your overall performance in the course is measured by the total number of points you accumulate relative to the maximum 700 points possible. Your letter grade in this course will be based on the distribution above, the standard scale used in the Mathematics Department.
- ✓ These are the only points possible in this class, there is no extra credit (or 'make up'), your asking for extra credit is a clear indication that you have not read your contract (this syllabus).

COURSE POLICIES

- ✓ You are responsible for all that is announced or covered in class even if you are absent.
- ✓ You are responsible for all the material in a given section unless told otherwise, use the course schedule and suggested homework as a guide.
- ✓ A prerequisite for additional help outside the classroom is regular class attendance.
- ✓ Every student is required to establish a *class contact*, that is, a fellow classmate that you may contact in case you are having a problem with a particular homework exercise at night/weekend or in the event you miss class, you can get the class notes from them.
- ✓ If you miss class, you are responsible for getting the notes from your 'class contact' (see above).
- ✓ Email is great for **simple** communications, but more complex issues must be handled in person.
- ✓ Don't use email as an excuse to avoid personal contact.
- ✓ Due to the overwhelming amount of email I receive, any email requests that involve a complicated response may not get addressed in a timely fashion, please come see me in that case.

- ✓ I expect you to read this syllabus and get clarification of any items you do not understand during the first week of class. After that, if you send me an email asking me about something covered in this syllabus, that email will likely be disregarded.

QUIZZES

- You will be given quizzes regularly. Keeping up with the homework, as detailed above, will ensure that you are prepared for the quizzes.
- The quizzes will be based largely on the suggested homework, and should be expected any day (if you are paying attention in class, I generally suggest when the next quiz will occur).
- Everyone is allowed to miss one quiz without penalty (for any reason); thus, there are NO make up quizzes. If you end up taking all of the quizzes, you may drop your low quiz score. Athletes or other individuals missing for school activities are to let me know BEFORE missing the quiz (or it lands above).
- The quizzes serve as an immediate assessment of the extent to which you mastered a particular assignment. Good quiz results should serve as positive feedback, but poor quiz results suggest that you must go back and master that material. Repeatedly failing quizzes will almost certainly lead to failing the course, you must take immediate and corrective action if you ever do poorly on a quiz.

EXAMS

- There will be four midterm exams given throughout the semester, in addition to the final exam. The material on the exams will be similar to topics covered on quizzes and homework.
- Students are required to take all exams at the scheduled hour as they appear on the syllabus and course schedule.
- There will be no late 'make-up' exams, as this is unfair to the rest of the class. If you know in advance you are going to miss a scheduled exam, let me know well in advance of the exam. Athletes, carefully review our exam schedule looking for conflicts.
- A missed exam will result in the final exam being worth 300 points (you do not lose any points for the missed exam, those points simply roll into the final exam). A second missed exam will receive a grade of 0 (zero).
- Our goal is not simply a 'correct answer'. But rather, you are to demonstrate the extent to which you understand each problem, this means organizing your work, a good write-up includes: connecting your work, proper notation, and an explanation of steps as you see necessary.
- Important Dates to Remember:
 - Exam 1: Friday, September 14th.
 - Exam 2: Friday, October 12th.
 - Exam 3: Friday, November 9th.
 - Exam 4: Wednesday, December 5th.
 - Final Exam: Thursday, December 13th, 10:30-12:30 AM.

MATH 111 · COLLEGE ALGEBRA TENTATIVE COURSE SCHEDULE · FALL 2018

Monday	Wednesday	Friday
	Aug 22 § 1.1: Algebraic Expressions, Real Numbers	Aug 24 § 1.2: Operations with Real Numbers
Aug 27 § 1.3: Graphing Equations § 1.4: Solving Linear Equations	Aug 29 § 1.5: Problem Solving and Using Formulas	Aug 31 § 1.6: Properties of Integral Exponents
Sep 3 No Class: Labor Day	Sep 5 §§ 2.1 & 2.2: Functions and Their Graphs	Sep 7 § 2.3: The Algebra of Functions
Sep 10 §§ 2.4 & 2.5: Linear Functions	Sep 12 § 3.1: Systems of Linear Equations	Sep 14 EXAM 1
Sep 17 § 4.1: Solving Linear Inequalities	Sep 19 § 4.2: Compound Inequalities	Sep 21 § 4.3: Equations, Inequalities with Abs Value (1)
Sep 24 § 4.3: Eqns, Inequalities with Abs Value (2)	Sep 26 § 5.1: Polynomials and Polynomial Functions	Sep 28 § 5.2: Multiplication of Polynomials
Oct 1 Hurst Day	Oct 3 § 5.3: Greatest Common Factors and Factoring by Grouping	Oct 5 No Class: Break
Oct 8 § 5.4: Factoring Trinomials	Oct 10 § 5.5: Factoring Special Forms (1)	Oct 12 EXAM 2
Oct 15 § 5.5: Factoring Special Forms (2) § 5.6: A General Factoring Strategy	Oct 17 § 5.7: Polynomial Equations and Applications	Oct 19 § 6.1: Rational Expressions and Functions
Oct 22 § 6.2: Adding Rational Expressions	Oct 24 § 6.3: Complex Rational Expressions	Oct 26 §§ 6.2 & 6.3: Rational Expressions
Oct 29 § 6.4: Division of Polynomials	Oct 31 § 6.6: Rational Equations (1)	Nov 2 § 6.6: Rational Equations (2)
Nov 5 § 7.1: Radical Expressions and Functions (1)	Nov 7 § 7.1: Radical Expressions and Functions (2)	Nov 9 EXAM 3
Nov 12 § 7.2: Rational Exponents (1)	Nov 14 § 7.2: Rational Exponents (2)	Nov 16 § 7.3: Multiplying and Simplifying Radical Expressions
Nov 19 § 7.4: Adding, Subtracting, and Dividing Radical Expressions	Nov 21 No Class: Thanksgiving	Nov 23 No Class: Thanksgiving
Nov 26 § 7.5: Rationalizing Denominators	Nov 28 § 7.6: Radical Equations (1)	Nov 30 § 7.6: Radical Equations (2) § 7.7: Complex Numbers
Dec 3 § 8.1 & 8.2: Quadratics	Dec 5 Review	Dec 7 EXAM 4
	Thursday Dec 13	FINAL EXAM 10:30 - 12:30

SERVICES:

TUTORING

Mercyhurst University and the Mathematics Department provide free tutoring for students enrolled in mathematics courses: *College Algebra* through *Calculus II*. <http://math.mercyhurst.edu/Tutoring/>.

SUPPORT OF THE MERCY MISSION

This course supports the mission of Mercyhurst University by creating students who are intellectually creative. Students will foster this creativity by: applying critical thinking and qualitative reasoning techniques to new disciplines; developing, analyzing, and synthesizing scientific ideas; and engaging in innovative problem solving strategies.

LEARNING DIFFERENCES

Mercyhurst University is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. Students with disabilities requiring accommodations should complete and submit [this form](#) and the required documentation to the Director of Equal Opportunity Programs (DEOP), aagnew@mercyhurst.edu. Accommodations will not be granted prior to approval by the DEOP and will not be provided retroactively. Further information is available by visiting the Learning Differences website: <http://www.mercyhurst.edu/academics/learning-differences-program>.

ADDITIONAL (FREE) RESOURCES

- **Khan Academy Algebra II:** <https://www.khanacademy.org/math/algebra2>
Includes material on manipulating functions, polynomials, rational functions, complex numbers, and modeling.
- **Wolfram Alpha:** <http://www.wolframalpha.com>
A great way to check your work. Free, with subscription available to access step-by-step solutions to problems.
- **College Algebra Textbook:** <http://stitz-zeager.com/szca07042013.pdf>
Free textbook by Carl Stitz and Jeff Zeager. Covers functions, graphing, polynomials, rational functions, modeling, exponential and logarithmic functions, and more, with practice exercises and some solutions.
- **Precalculus Textbook:** <http://www.opentextbookstore.com/precalc/1.5/Precalc.pdf>
Free textbook by David Lippman and Melonie Rasmussen. Covers just about everything in Math 111, in the same sequence.

MATH 111 · SUGGESTED HOMEWORK · FALL 2018

Section	Exercises
Day One	→ Carefully RE-READ and UNDERSTAND the Syllabus ←
§ 1.1: Algebraic Expressions	17, 49, 63, 65, 73
§ 1.2: Operations with Real Numbers	1, 13, 19, 21, 37, 41, 49, 55, 59, 61, 85, 89, 91, 95, 99, 113, 123, 127, 129
§ 1.3: Graphing Equations	57 - 60, 61, 64
§ 1.4: Solving Linear Equations	3, 11, 17, 19, 23, 25, 29, 33, 37, 59, 65
§ 1.5: Problem Solving and Using Formulas	35, 37, 41, 45, 61, 63
§ 1.6: Properties of Integral Exponents	17, 21, 23, 27, 35, 37, 39, 47, 55, 61, 71, 81, 87, 97, 103, 109, 111, 119, 121, 123
§ 2.1: Functions	3, 15, 19, 21, 25, 31
§ 2.2: Graphs of Functions	3, 5, 11 - 18, 19, 23, 25, 29, 31, 37, 64 - 67
§ 2.3: The Algebra of Functions	13, 15, 31, 37, 39, 43, 51, 53
§ 2.4: Linear Functions and Slope	1, 9, 17, 19, 23, 27, 31, 33, 37, 47, 51, 61, 62, 67, 75
§ 2.5: Equations of a line	3, 7, 11, 17, 19, 23, 27, 33, 41, 45, 49, 53, 57
Exam 1	
§ 4.1: Solving Linear Inequalities	3, 7, 15, 19, 21, 25, 29, 33, 35, 43
§ 4.2: Compound Inequalities	1, 7, 9, 11, 13, 19, 21, 23, 27, 29, 31, 33, 41, 47, 49, 53, 55
§ 4.3: Eqns, Inequalities with Abs Value (1)	3, 7, 17, 21, 41, 43, 45, 51, 55, 57, 59, 61, 63, 71
§ 4.3: Eqns, Inequalities with Abs Value (2)	15, 27, 65, 67, 69, 72, 73, 79, 105
§ 5.1: Polynomials and Poly Functions	1, 5, 11, 17, 19, 21-24, 25-28, 29, 39, 41, 49, 71, 105
§ 5.2: Multiplication of Polynomials	3, 5, 7, 15, 19, 21, 22, 25, 29, 43, 49, 53, 55, 71, 81, 99, 101, 105
§ 5.3: GCF and Factoring by Grouping	3, 7, 9, 21, 23, 31, 35, 39, 43, 47, 49, 55, 59, 65, 67, 71, 73, 81
§ 5.4: Factoring Trinomials	5, 9, 15, 21, 35, 37, 39, 49, 55, 57, 69, 73, 81
Exam 2	
§ 5.5: Factoring Special Forms (1)	1, 3, 7, 19, 23, 29, 33, 35, 39, 45, 49, 55, 65, 75
§ 5.5: Factoring Special Forms (2)	13, 21, 41, 47, 81, 85, 103
§ 5.6: A General Factoring Strategy	7, 11, 15, 17, 21, 37, 39, 47, 61, 63, 67, 69, 79
§ 5.7: Polynomial Equations and Apps	5, 11, 13, 15, 21, 25, 27, 29, 31, 35, 37, 43, 45
§ 6.1: Rational Expressions and Functions	1, 9, 13, 31, 37, 43, 49, 55, 61, 65, 67, 79, 81, 83, 89
§ 6.2: Adding Rational Expressions (1)	3, 7, 9, 11, 19, 23, 29, 31, 39
§ 6.2: Adding Rational Expressions (2)	25, 27, 37, 41, 45, 47, 51, 57, 71
§ 6.3: Complex Rational Expressions	3, 7, 9, 13, 15, 19, 23, 27, 29, 39, 47
§ 6.2: Adding Rational Expressions	49, 53, 55, 69
§ 6.3: Complex Rational Expressions	33, 41, 43, 49

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MATH 111 · SUGGESTED HOMEWORK · FALL 2018

Section	Exercises
§ 6.4: Division of Polynomials	3, 15, 25, 27, 33, 35, 45, 47
§ 6.6: Rational Equations (1)	3, 5, 9, 13, 15, 17, 19, 21, 23, 27
§ 6.6: Rational Equations (2)	11, 20, 22, 29, 35, 39, 41, 47
Exam 3	
§ 7.1: Radical Expressions and Functions (1)	1, 3, 5, 7, 9, 15, 17, 33-49(odd), 53, 61, 73, 77, 79, 81, 87
§ 7.1: Radical Expressions and Functions (2)	19, 51, 55, 67, 69, 89
§ 7.2: Rational Exponents (1)	3, 5, 15, 17, 27, 29, 31, 45, 47, 55, 57, 59, 61, 65, 71, 73, 75, 77, 81, 87, 113, 115, 121, 123
§ 7.2: Rational Exponents (2)	13, 33, 37, 51, 53, 72, 74, 78, 114, 116, 122, 124
§ 7.3: Radical Expressions	1, 7, 11, 15, 17, 19, 21, 25, 27, 29, 33, 43, 49, 61, 65, 67, 69, 71, 75
§ 7.4: Radical Expressions	5, 7, 11, 13, 15, 21, 23, 31, 37, 45, 49, 53, 57, 67, 71
§ 7.5: Rationalizing Denominators	3, 5, 9, 13, 17, 21, 23, 29, 31, 39, 47, 49, 65, 69, 73, 83, 87, 101
§ 7.6: Radical Equations (1)	7, 10, 11, 14, 17, 21, 23, 31, 34, 39
§ 7.6: Radical Equations (2)	19, 32, 43, 45
§ 7.7: Complex Numbers	1, 7, 15, 19, 23, 39
§ 8.1: Completing the Square	1, 5, 35, 51, 55
§ 8.2: The Quadratic Function	3, 9, 13, 37, 41, 45
Exam 4	