

**MATH 121: Intermediate Algebra (Spring 2004)**

Instructor: Brad Thiessen  
Office: Ambrose 414  
Office Hours: MWF 10:00 – 2:00, 3:00 – 5:00

**Section F:** MWF from 2:00 – 2:50 in Ambrose 413A**Section M:** MW from 5:10 – 6:25 in Ambrose 413B

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## Catalog Description:

Algebraic operations, linear equations and inequalities, problem solving, polynomial expressions, factoring rational expressions and equations, radical expressions and equations, quadratic equations. Competency level of “C” or better is required to enroll in higher-level courses.

## Required Materials:

*Intermediate Algebra Alternate Version (8<sup>th</sup> edition)* by Lial, Hornsby, Mcginnis (ISBN: 0-321-02982-8)  
Notebook or binder for notes and assignments  
Calculator

## Prerequisites:

MATH 090 or appropriate placement test score.

## Outline of Major Topics:

- |  |                         |
|--|-------------------------|
| 1) Graphs, linear equations, and linear inequalities | 3) Rational expressions |
| 2) Exponents, polynomials, and factoring             | 4) Roots and radicals   |

## Course Overview &amp; Procedures:

This course is designed to give you the fundamental knowledge, concepts, and skills you will need in order to successfully complete more advanced math courses. At the beginning of each class, we will work through a “big problem” (a real-world application of algebra). From this big problem, we will learn specific vocabulary, concepts, skills, and problem solving strategies. It is my hope that by the end of this course, you will be able to apply what you have learned to understand and solve real problems.

You must pass this course with at least a C in order to take a higher-level math course and fulfill your general education math requirement). In this course, you will have a good opportunity to earn at least a C. Actually, you will have two opportunities...

I have created two tests (Test A and Test B) for each unit in this course. On the scheduled test days, I will administer Test A to all students. If you're not satisfied with the grade you earn on Test A, you may schedule a time outside of class to take Test B. The higher of your two test grades will be recorded as your grade for the unit. To help clear any confusion, let's look at some examples of this process:

1. Joe made a few careless mistakes on Test A last Friday and earned a 70%. Since he knew he could improve on that score, Joe scheduled time outside of class to take Test B. He earned an 85% on Test B, so his grade for the unit is 85%.
2. Brad earned a 90% on Test A for unit 3, but he thought he could get a perfect score if he had another chance. He scheduled time to take Test B and earned a score of 80%. Since the higher of his two scores is 90%, Brad's unit score is 90%.
3. Mary already has a solid grasp of algebra (she is in this course because of a low placement exam score), so she schedules time at the beginning of each unit to take Test B. She earns an 80% on Test B for unit #1. If Mary wants a chance to improve her unit score, she can take Test A during the scheduled class day. If she is satisfied with her grade, she does not have to attend class during the rest of this unit.

Note: Test A and Test B will test the same learning objectives and will be approximately equal in difficulty. Each test, however, will contain unique questions (multiple choice, true-false, and short answer). If you score poorly on Test A and do nothing to improve your understanding of the material, you will score poorly on Test B.

Student Evaluation: Students can select on of the two following grading options:

- 1) Standard option: Four unit exams each worth 20% of your grade (80% total)  
Four homework submissions each worth 5% of your grade (20% total)
- 2) No homework option: Four unit exams each worth 25% of your grade (100% total)

Grading Scale: A: 90% and above  
B: 80% and above  
C: 65% and above  
D: 50% and above  
F: below 50%

Attendance and participation will be taken into account for borderline grades.

All students are expected to:

1. attend class. While I will not take attendance during class, it is important that you show up on time prepared for class. Absent students will miss out on class discussions and activities that will be used to introduce and reinforce concepts. Students missing a scheduled exam will forfeit their second chance to take the unit exam.
2. complete all assigned readings and participate in class discussions. I ask questions during class – lots of questions. If you try to answer these questions (and ask questions of your own), you **will** learn the material.
3. successfully complete all exams. In order to earn a C in this course, you must score at least 65% on each unit exam. You may use a calculator on each exam.
4. take responsibility for their learning. I encourage you to work collaboratively on assigned problems and ask questions in class. If you need additional help, feel free to stop by my office anytime. You can also get help from the tutoring service on campus.

Monday		Wednesday		Friday	
		1/14	Introductions Syllabus Review/Course overview • Read 2.1	1/16	Linear Equations (2.1) • p.51: 19, 31, 39, 41, 47, 51, 53, 57, 59, 65 • Read 2.2
1/19	<b>No class</b>	1/21	Formulas • p.58: 7, 15, 17, 21, 25, 39, 49, 57 • Read 6.1	1/23	Graphing • p.336: 25, 29, 37, 49, 55, 57, 65 • Read 6.2
1/26	Slope • p.349: 1, 17, 33, 45, 49, 51, 57, 59, 61, 69 • Read 6.3	1/28	Linear Equations • p.363: 17, 19, 31, 37, 41, 43, 47, 63, 65, 69, 71 • Read 2.3	1/30	Applications of Linear Equations • p.70: 11, 17, 19, 23, 25, 31, 35, 39, 47, 53, 55 • Read 2.4
2/2	More Applications • p.79: 13, 15, 21, 25, 29, 31, 33, 39 • Read 2.5	2/4	Linear Inequalities • p.91: 11, 15, 23, 33, 39, 41, 55, 57	2/6	Exam #1 Review
2/9	<b>Exam #1 Collect Unit #1 Homework</b>	2/11	Review exam #1 results • Read 3.1	2/13	Exponents and Polynomials • p.134: 13, 17, 19, 25, 79, 85, 97, 111, 113, 131 • Read 3.2
2/15	Add/Subtract Polynomials • p.145: 33, 39, 43, 45, 81 • Read 3.3	2/17	Multiply Polynomials • p.154: 13, 19, 25, 47, 73 • Read 3.4	2/19	Factoring Polynomials • p.160: 9, 15, 27, 47, 53, 61, 71 • Read 3.5
2/22	Factoring Polynomials • p.169: 5, 9, 17, 41, 51, 67, 75 • Read 3.8	2/25	Solving via Factoring • p.184: 5, 23, 39, 49, 61, 67, 73	2/27	Page 187 group activity Factoring and graphing
3/1	Exam #2 Review	3/3	<b>Exam #2 Collect Unit #2 Homework</b>	3/5	<b>Form B Exam Day</b>
3/8	<b>Spring Break</b>	3/10	<b>Spring Break</b>	3/12	<b>Spring Break</b>
3/15	Review exam #2 results • Read 4.1	3/17	Rational Expressions • p.206: 9, 15, 17, 19, 29, 39, 55 • Read 4.2	3/19	Add/Subtract Rational Expression • p.214: 15, 43, 51, 55, 61, 65 • Read 4.3
3/22	<b>Form B Exam Day</b>	3/24	Complex Fractions • p.222: 7, 11, 13, 17, 19 • Read 4.6	3/26	Equations with Rational Exp. • p.236: 13, 17, 23, 29, 41 • Read 4.7
3/29	Applications of Rational Exp. • p.247: 17, 23, 31, 33, 37, 45, 49	3/31	Catch-up day	4/2	Review for Exam #3
4/5	<b>Exam #3 Collect Unit #3 Homework</b>	4/7	Review Exam #3 results • Read 5.1	4/9	<b>No class</b>
4/12	<b>No class</b>	4/14	Rational Exponents and Radicals • p.272: 21, 27, 41, 65, 89, 139 • Read 5.2	4/16	Simplifying Radical Expressions • p.281: 17, 55, 67, 73, 99, 101 • Read 5.3
4/19	Add/Subtract Radical Expression • p.287: 21, 23, 31 • Read 5.4	4/21	Multiply Radical Expressions • p.295: 25, 45, 67, 71, 77 • Read 5.5	4/23	Equations With Radicals • p.303: 9, 15, 33, 43, 51, 53
4/26	Review for Exam #4	4/28	<b>Exam #4 Collect Unit #4 Homework</b>	4/30	<b>Form B Exam Day</b>

**Final Exam:**

Monday		Wednesday	
		1/14	Introductions Syllabus Review/Course overview • Read 2.1, 2.2
1/19	<b>No class</b>	1/21	Linear Equations and Formulas • p.51: 3, 19, 31, 39, 41, 47, 51, 53, 57, 59, 65 • p.58: 7, 15, 17, 21, 25, 39, 49, 57 • Read 6.1 – 6.3
1/26	Graphing, Slope, Linear Equations • p.336: 25, 29, 37, 49, 55, 57, 65 • p.349: 1, 17, 33, 45, 49, 51, 57, 59, 61, 69 • p.363: 17, 19, 31, 37, 41, 43, 47, 63, 65, 69 • Read 2.3	1/28	Applications of Linear Equations • p.70: 11, 17, 19, 23, 25, 31, 35, 39, 47, 53, 55 • Read 2.4
2/2	More Applications of Linear Equations • p.79: 13, 15, 21, 25, 29, 31, 33, 39 • Read 2.5	2/4	Linear Inequalities & Review • p.91: 11, 15, 23, 33, 39, 41, 55, 57
2/9	<b>Exam #1</b> <b>Collect Unit #1 Homework</b> • Read 3.1	2/11	Review exam results Exponents and Polynomials • p.134: 13, 17, 19, 25, 79, 85, 97, 111, 113, 131 • Read 3.2, 3.3
2/15	Add/Subtract/Multiply Polynomials • p.145: 33, 39, 43, 45, 81 • p.154: 13, 19, 25, 47, 73 • Read 3.4	2/17	Factoring Polynomials • p.160: 9, 15, 27, 47, 53, 61, 71 • Read 3.5
2/22	Factoring Polynomials & Graphing • p.169: 5, 9, 17, 41, 51, 67, 75 • Read 3.8	2/25	Solving via Factoring • p.184: 5, 23, 39, 49, 61, 67, 73
3/1	Catch-up day Review for Exam #2	3/3	<b>Exam #2</b> <b>Collect Unit #2 Homework</b> • Read 4.1
3/8	<b>Spring Break</b>	3/10	<b>Spring Break</b>
3/15	Rational Expressions • p.206: 9, 15, 17, 19, 29, 39, 55 • Read 4.2	3/17	Add/Subtract Rational Expression • p.214: 15, 43, 51, 55, 61, 65 • Read 4.3
3/22	Complex Fractions • p.222: 7, 11, 13, 17, 19 • Read 4.6	3/24	Equations with Rational Exp. • p.236: 13, 17, 23, 29, 41 • Read 4.7
3/29	Applications of Rational Exp. • p.247: 17, 23, 31, 33, 37, 45, 49	3/31	Catch-up day Review for Exam #3
4/5	<b>Exam #3</b> <b>Collect Unit #3 Homework</b> • Read 5.1	4/7	Rational Exponents and Radicals • p.272: 21, 27, 41, 65, 89, 139 • Read 5.2
4/12	<b>No class</b>	4/14	Simplifying Radical Expressions • p.281: 17, 55, 67, 73, 99, 101 • Read 5.3
4/19	Add/Subtract Radical Expression • p.287: 21, 23, 31 • Read 5.4	4/21	Multiply Radical Expressions • p.295: 25, 45, 67, 71, 77 • Read 5.5
4/26	Equations With Radicals Review for Unit #4 Exam • p.303: 9, 15, 33, 43, 51, 53	4/28	<b>Exam #4</b> <b>Collect Unit #4 Homework</b>

**Final Exam:**

## Unit #1 Learning Objectives:

- [2.1] Solve linear equations in one variable
  - Addition and multiplication properties of equality
  - Distributive property
  - Conditional equations, contradictions, and identities
- [2.2] Solve formulas for a specified variable
- Solve applied problems using formulas
- [6.1] Find and plot ordered pairs that satisfy a given equation
- Graph lines; recognize equations of horizontal and vertical lines
- Find x- and y-intercepts
- Understand and use the distance formula
- [6.2] Find the slope of a line given...
  - ... two points on the line
  - ... the formula of the line
- Graph a line given its slope and a point on the line
- Recognize parallel and perpendicular lines from the slopes of those lines
- Use the concept of slope to solve problems
- [6.3] Write the equation of a line given...
  - ... its slope and a point on the line
  - ... two points on the line
  - ... its slope and y-intercept
- Model real data using linear equations
- [2.3] Write equations from given information
- Solve problems about unknown quantities (percents, mixtures, angles)
- [2.4] Solve problems about money, uniform motion, and geometric figures
- [2.5] Solve linear inequalities
- Solve applied problems using linear inequalities

## Unit #2 Learning Objectives:

- [3.1] Simplify expressions using rules of exponents
  - Product, quotient, power rules for exponents
  - Understand negative exponents
  - Convert numbers to scientific notation
- [3.2] Find the degree of a polynomial
- Add and subtract polynomials
- Evaluate polynomials
- [3.3] Multiply two polynomials
- Understand the FOIL method
- [3.4] Factor polynomials...
  - ... factor out the greatest common factor
  - ... factor by grouping
- [3.5] Factor trinomials
- Factor trinomials by substitution
- Use the quadratic formula
- [3.8] Use the zero-factor property to solve applied problems

### Unit #3 Learning Objectives:

- [4.1] Find numbers that make rational expressions undefined  
Write rational expressions in lowest terms  
Multiply and divide rational expressions  
Find reciprocals for rational expressions
- [4.2] Add and subtract rational expressions  
Find the least common denominator
- [4.3] Simplify complex fractions by...
  - ... simplifying numerator and denominator
  - ... multiplying by a common denominator
- [4.6] Solve rational equations
- [4.7] Solve applications using rational expressions (proportions, work rates)

### Unit #4 Learning Objectives:

- [5.1] Simplify expressions involving rational exponents and radicals  
Convert between rational exponents and radicals
- [5.2] Simplify radicals  
Find the length of a side of a right triangle using the Pythagorean Theorem
- [5.3] Simplify radical expressions involving addition and subtraction
- [5.4] Rationalize denominators  
Write radical quotients in lowest terms
- [5.5] Solve radical equations