

**Math 125**                                      **Intermediate Algebra**                                      **5 Units**

**MTWTh 8:00-9:15**

**Room: MSA 109**                                      **Section:**                                      **Spring 2015**

**Instructor: William J. Bucher**      **Office MSB 207**      **e-mail bucherw@wlac.edu**

**Office Hrs: 7:30-8:00 AM MTWTh in room MSB 207 and 12:30-3:30 MW in MSB 207; or by appointment**

**Office Phone: (310) 287-4211 Note: It is better to e-mail so there is a written record.**

**Course Description:**

Manipulative skills in algebra are developed and strengthened in this course. The topics include rational exponents, the complete number system of algebra, algebraic and graphic solutions to linear and quadratic equations, logarithmic and exponential functions, elementary theory of equations, inequalities and conics.

**Math Program SLO—Student Learning Objectives**

- 1.) Apply quantitative thinking processes using basic mathematical operations (addition, subtraction, multiplication, division) to solve common academic, workplace and family problems. (Theme: Mathematical Operations)
- 3.) Use mathematical tools essential for analyzing quantitative problems and for producing solutions. (Theme: Mathematical Tools)
- 5.) Select appropriate math strategies for solving and handling real life problems involving finance, economics, and family issues. (Theme: Mathematical Problem-Solving)

**Math 125 SLO—Student Learning Objectives**

- 1.) Select and use appropriate algebraic techniques to solve a wide variety of equations and systems of equations.
- 2.) Analyze, model, and solve application problems including those involving variations.
- 3.) Construct and analyze graphs of functions, inequalities, and conic sections.

**Specific Learning Objectives:**

Upon satisfactory completion of the course, a student will be able to:

- 1.) Simplify a wide variety of numerical expressions using the properties of the real and complex numbers and the order of operations.
- 2.) Know and accurately use a wide variety of formulas pertaining to many application problems.
- 3.) Solve a wide variety of first degree equations and inequalities.
- 4.) Find solution set of inequalities involving absolute values.
- 5.) Know and use the distance and mid-point formulas.
- 6.) Graph linear equations in two variables—lines.
- 7.) Find the slope and x-and y-intercepts of lines.
- 8.) Determine when two lines are parallel, perpendicular or neither.
- 9.) Write an equation for a line given certain essential information about the line.
- 10.) Graph the solution set for linear inequalities in two variables.
- 11.) Distinguish between a function and a relation—understand the concepts of domain and range.
- 12.) Determine the domain and range of a variety of basic functions and sketch their graphs.
- 13.) Use translations and reflections to graph a wide variety of more complicated functions.
- 14.) Solve systems of equations by the graphing, substitution, and addition/elimination methods.
- 15.) Use Gaussian Elimination to solve  $2 \times 2$  and  $3 \times 3$  systems.
- 16.) Recognize inconsistent and dependent systems.
- 17.) State the infinite solutions for a dependent system by using parameterization.
- 18.) Use matrix methods, coupled with back substitution, to solve systems of LEQ's.
- 19.) Use determinants and Cramer's Rule to solve systems of LEQ's.
- 20.) Solve a wide variety of application problems using systems of linear equations.
- 21.) Graph the solution set for a system of linear inequalities.
- 22.) Perform the standard operations on polynomials.
- 23.) Factor a wide variety of polynomials.
- 24.) Use factoring to solve higher degree polynomial equations.
- 25.) Perform the standard operations on rational expressions.
- 26.) Use synthetic division when appropriate.
- 27.) Simplify rational expression by extensive use of factoring.
- 28.) Solve a wide variety of equations involving rational expressions.
- 29.) Use proportions and variation to solve a wide variety of application problems.
- 30.) Exploit the connection between radicals and rational exponents to simplify algebraic expressions.
- 31.) Perform the standard operations on radical expressions.
- 32.) Perform all the standard operations with complex numbers.
- 33.) Use all the standard methods for finding solutions to quadratic equations.
- 34.) Find the domain, graph and find the range of a wide variety of functions, including: quadratic, rational, root, and absolute value functions.

- 35.) Understand and use the algebra of functions.
- 36.) Understand and use composition of functions.
- 37.) Determine when a function is 1-1.
- 38.) Determine the inverse of a function, if it is 1-1.
- 39.) Understand the relationship between exponential functions and logarithmic functions.
- 40.) Find the domain, graph and find the range of a wide variety of exponential and logarithmic functions.
- 41.) Solve logarithmic and exponential equations.
- 42.) Solve a variety of application problems that involve exponential and/or logarithmic expressions.
- 43.) Understand the binomial theorem and use it to find the terms of higher powers of binomials—this involves understand permutations and combinations.
- 44.) Manipulate equations that represent conic sections (circles, parabolas, ellipses, hyperbolas) into standard form and graph the objects accurately.
- 45.) Solve systems of nonlinear equations.

**Textbook: Intermediate Algebra,** Lial, Hornsby, McGinnis, 11th edition, Addison-Wesley. There is a softcover available in the bookstore. Students can also find it online at the usual places.

Schedule: See Tentative Schedule page.

**Homework,  
Quizzes,  
Tests &  
Grading:**

1.) Homework assignments from the text and/or in the form of supplements will be given every day. We shall discuss the assigned problems at the beginning of each class period. Not all of the homework will be collected. Certain of designated problems will be collected at the end of each week. I will spot check 4 randomly chosen problems. A simple score of 1-10 will be given on these chosen problems. Collectively, they will make up 6% of your final course grade. **Doing all the assigned exercises and solving problems outside of class is where you learn the most!** Some effort should be made to keep this “done” homework in an organized fashion. It is very useful when studying for tests and quizzes

2.) There will be a short quiz every week. These will really be short, i.e., 10-15 minute duration. The purpose of these quizzes is to guarantee that the student stays current with the class lectures and activities. There will be approximately 14-15 of these quizzes. I will throw out your 3 worst quizzes in computing your average quiz score. The remaining quizzes will make up 12% of your final course grade. **There will absolutely be no makeup quizzes!**

3.) There will be 4 tests. These will be of full period duration. See schedule for approximate dates. Makeup examinations will be given only to those students possessing **documented valid excuses. Advanced notice is mandatory.** Don't miss an examination and then show up. Call or write me ahead of time and make an arrangement to take the test. In order to be fair to the students who took the exam as scheduled, makeup examinations will always be substantially more difficult than the original. Each of the four examinations will be worth 13% of your final course grade, making a total of 52% for all four exams.

4.) The final examination will be a departmentally designed, comprehensive examination. This exam will be worth the remaining 30% of your final course grade. This is heavily weighted so it is extremely important that the student do well on this examination in order to do well in the course.

### **Summary**

Collected Homework	6%
Quizzes (approx 15, throw out worst 3)	12%
Tests ( 4 at 13% each)	52%
Final Examination	<u>30%</u>
Total	100%

**Note about Attendance:** If you miss more than 4 meetings (a week) of the course, the instructor has the option of excluding you from the course. I generally will contact you, if you reach this limit, but be aware of the fact that I will utilize this option at the earliest possible date. Once you have been excluded, there will be no reinstatement.

### **Note about Grading Scale:**

I use a straight scale:	100-90% A
	89-80% B
	79-68% C
	67-55% D
	54-00% F

In very unusual circumstances, some norming will be done, but usually my quizzes and tests are straightforward and there is no need to norm.

### **Calculators:**

In this and future courses, the use of calculators is permitted and encouraged. I advise you to buy a scientific graphing calculator with statistical capabilities. **You may not use**

**your cell phones as calculators during quizzes or examinations!!! REPEAT: No cell phone will be allow on tests or quizzes. Get a calculator!!**

**Cell Phones:**

**Cell phone use is strictly forbidden in the classroom.** If you possess a cell phone, it must be set on silent vibrate mode. If you absolutely must take an emergency call, please exit the classroom quietly and do so outside.

**Academic Dishonesty**

Cheating or plagiarism will not be tolerated. Any cases of either will be referred to the Dean of Students for disciplinary action. For more on acceptable behavior, read *Standards of Student Conduct* on page 119 of the Schedule of Classes.

Tentative Schedule for Math 125 (1486)

Month	Mon.	Tues.	Wed.	Thu.	Sections Covered
Feb.	9	10	11	12	Chap 1, 2.1-2.2
	H	17	18	19	2.3-2.7
	23	24	25	26	3.1-3.5
March	2	3	4	5	3.6, 4.1-4.3 Test 1-3
	9	10	11	12	4.4, 5.1-5.5,
	16	17	18	19	6.1-6.5
	23	24	25	26	7.1-7.5
April	30	31	1	2	7.6, 8.1 Test 4-7
	SPRING BREAK SPRING BREAK APRIL 4-10				
	13	14	15	16	8.2- 8.7
	20	21	22	23	9.1—9.4
May	27	28	29	30	9.5-9.7
	4	5	6	7	10.1-10.3 Test 8-9
	11	12	13	14	10.5-10.6, 11.1-11.2
	18	19	20	21	11.3-11.4,
	H	26	27	28	12.4, Test 10-11
	June	1		F	Final

Final Examination: June 3, 2015, 8:00-10:00 AM

Last date to drop without a fee—Feb. 12

Last day to drop without a W—Feb. 12

Last day to drop with a W—March 20