MATH 126A – College Algebra (Updated September 5, 2014)

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Class room/time	ENGR 513 MTWRF 12-12:50
Office Hours	Mon. 1-4 Tue. 2-4 (Tutorial lab) Wed. 1-4 Fri. 1-2

Catalog Data MATH 126A College Algebra (3-2) Credits 3. (For engineering, science, or mathematics students with 2 units each of high school algebra, 1 unit of high school geometry and a math ACT score of 19-22; MATH 93) (3 credits applicable toward degree requirements.) Review of the real number system and algebraic expressions, equations, inequalities, graphing, functions, exponential and logarithmic functions, basic matrix operations and properties systems of equations, polynomials.

Textbook Stewart/Redlin/Watson, *Algebra and Trigonometry*, Third Edition, Brooks/Cole, Cengage Learning 2012.

Chapters Covered

Review Chapter, sections 2,3,4,5,6,7
Chapter 1, sections 1,2,3,4,5,6,7
Chapter 2, sections 1,2,4
Chapter 3, sections 1,2,3,4,5,6,7
Chapter 4, sections 1,2,3,4(OPT),6
Chapter 5, sections 1,2,3,4,5
Chapter 11, sections 1,2,3(OPT),8(OPT)

Reference None

Objective Upon completion of this course the student should have good algebraic manipulative skills, good graphing techniques and be able to work with matrices.

Outcomes Upon completion of this course, the student will be able to:

1. Use the laws of exponents, and manipulate and simplify algebraic expressions containing fractional exponents, negative exponents, radicals, and fractions.
2. Solve linear, quadratic, polynomial and other equations.
3. Solve linear, quadratic, and rational inequalities.
4. Solve word problems.
5. Sketch graphs of linear, quadratic, polynomial, rational, and multi-part functions.
6. Find the composition of functions, the inverse of a function, and the domain and range of a fuction.

7. Do matrix operations and use matrix techniques to solve a system of linear equations.

This course satisfies GEC 2: Basic Mathematical Skills and Scientific Inquiry. The use of quantitative and scientific knowledge effectively.

Grades

Homework		10%
Best 7 of 8 quizzes	3% each	21%
4 Tests	12% each	48%
Final exam (cumulative)		21%

A	90-100%
B	80-90%
C	70-80%
D	60-70%
F	0-60%

Homework Homework will be completed online using the program WebAssign. You will need to purchase an access code to WebAssign (about $75) which comes with an electronic copy of the textbook, OR purchase a new copy of the textbook (about $125) which comes with an access code to WebAssign (these discounted prices are available at our bookstore). You can access WebAssign for free for the first 2 weeks of class, but make sure you enter an access code before that time is done. Homework problems will be assigned in WebAssign for each section. Use WebAssign to find your specific problems. Work each problem in your homework notebook and submit your answer into WebAssign to find if your answer is correct. Each problem will allow 20 submissions. Resubmit each problem until it is correct to maximize your homework score. Homework sections assigned during the week will be due on Fridays at class time. No extensions on homeworks will be given.

WebAssign Login Information

Username:	(Your MIX ID)
School:	WVUTech
Password:	(Last four digits of your ID number)

Quizzes Eight quizzes will be given through the semester. The top seven scores will count. Make-up quizzes will not be given without a university excuse.

Tentative quiz dates 29 Aug, 5 Sept, 19 Sept, 26 Sept, 10 Oct, 24 Oct, 7 Nov, and 14 Nov.

Exams Four 1-hour exams will be given through the semester. One final exam will be given according to the University schedule. If your score on the final exam is higher than another exam score, then I will replace your lowest exam score with the final exam score. No make-up exams will be given after the exam date. If you have a legitimate excuse, you may schedule with me for an early exam. Otherwise, if you are not in class to take an exam on the exam day, you will receive a zero for that exam.

Tentative exam dates Sept 12, Oct 3, Oct 31, and Nov 21. Your Final Exam is scheduled according to the WVU Tech Finals Schedule.

Schedule of assignments

Week 1 Read the review chapter and complete assigned problems from sections P2, P3, P4.

Week 2 Read sections 1.1, 1.2 and complete assigned problems from sections P5, P6.

Week 3 Read sections 1.3, 1.4, 1.5 and complete assigned problems from sections P7, 1.1, 1.2.

Week 4 Read sections 1.6, 1.7, 2.1 and complete assigned problems from sections 1.3, 1.4, 1.5.

Week 5 Read sections 2.2, 2.4, 2.5 and complete assigned problems from sections 1.6, 1.7.

Week 6 Read sections 3.1, 3.2 and complete assigned problems from sections 2.1, 2.2, 2.4.

Week 7 Read sections 3.3, 3.4, 3.5 and complete assigned problems from sections 2.5, 3.1, 3.2.

Week 8 Read sections 3.6, 3.7 and complete assigned problems from sections 3.3, 3.4.

Week 9 Read sections 4.1, 4.2 and complete assigned problems from sections 3.5, 3.6.

Week 10 Read sections 4.3, 4.4 and complete assigned problems from sections 3.7, 4.1.

Week 11 Read sections 4.6, 5.1 and complete assigned problems from sections 4.2, 4.3, 4.4.

Week 12 Read sections 5.2, 5.3, 5.4, 5.5 and complete assigned problems from sections 4.6, 5.1.

Week 13 Read sections 11.1, 11.2 and complete assigned problems from sections 5.2, 5.3, 5.4.

Week 14 Read sections 11.3, 11.8 and complete assigned problems from sections 5.5, 11.1.

Week 15 Review semester material and complete assigned problems from sections 11.2, 11.3, 11.8.

Week 16 Review semester material.

Topics

1. Basic Algebra (9 days)
   (a) Real numbers and integer exponents
   (b) Algebraic expressions
   (c) Factoring
   (d) Rational expressions
   (e) Radicals and rational exponents
   (f) Complex numbers
2. Equations and Inequalities (9 days)
   (a) Linear equations
   (b) Applications of linear equations
   (c) Quadratic equations
   (d) Other types of equations
   (e) Linear inequalities
   (f) Quadratic and rational inequalities
   (g) Equations and inequalities involving absolute value
3. Graphs and Functions (9 days)
   (a) The rectangular coordinate system
   (b) Graph of equations
   (c) The line
   (d) The circle
   (e) Variations
   (f) Functions
   (g) Graphing techniques

(h) Composite and inverse functions

4. Polynomial and Rational Functions (8 days)
   (a) Quadratic functions
   (b) Polynomial functions
   (c) Rational functions
   (d) Remainder and the factor theorems
   (e) Zeros of a polynomial and fundamental theorem of algebra
5. Systems of Equations (8 days)
   (a) Elimination and substitution
   (b) Gaussian elimination and matrix methods
   (c) Determinants and Cramers rule
   (d) Matrix operations
   (e) Nonlinear systems
6. Exponential and Logarithmic functions (9 days)
   (a) Exponential Functions
   (b) Logarithmic Functions
   (c) Properties of Logarithms
   (d) Logarithmic and Exponential Equations
   (e) Compound Interest (opt)
   (f) Growth and Decay (opt)
   (g) Logarithmic Scales (opt)

Computer Usage WebAssign for homework submission.

Laboratory Projects None

ABET Category Content Mathematics – Credit 3 or 100

Tutoring The math department has a math tutorial lab open from 8am to 4:30pm. Free tutoring will be available from your math professors and some math majors during some of these hours. Free tutoring is also available through Student Support Services, which is located in Old Main, and the Student Success Center, which is located in the library.

Class Policies All electronic devices must be turned off and put away during class; disruptions can distract your professor and your fellow students. Graphing calculators are not allowed. You are not allowed to use your phone as a calculator. Anyone caught cheating including things like copying another students answers or using a cheat sheet or an unapproved device will receive a zero for the quiz or exam and will be reported to the appropriate university authorities. Inappropriate behavior in the classroom will not be tolerated.

Social Justice Statement The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Disability Services (304.981.6210). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see `http://diversity.wvu.edu`.

Academic Integrity The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code `http://studentlife.wvu.edu/office_of_student_conduct/student_conduct_code`. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

Disclaimer The professor reserves the right to make any necessary adjustments and/or modifications to this syllabus.