

# MTH 127-105 - College Algebra Expanded

Department of Mathematics, College of Science

**Instructor:** Tom Cuchta (call me Tom)

**Time:** 10:00-10:50 MTWRF

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**Office:** Smith Hall 314

**Office Hours:** 2:00-3:00 MTW

9:00-10:00 Thursday

12:00-1:00 Friday

**Textbook:** College Algebra - Michael Sullivan (ISBN: 0-13-240286-6)

**Technology:** Marshall University computer account; graphing calculator, preferably TI-83 or higher, a graphing calculator is required!

**Attendance and Daily Quiz:** attendance itself is not required, but there will be a daily quiz grade given at the end of class on recent topics that we have covered, each quiz will be worth 10 points and be designed to test knowledge that was recently covered in class. At the end of the semester, your lowest three quiz scores will be dropped.

**Homework:** there will be nightly homework that will be graded and due the next day -- meaning legitimately try every problem and we will spend some time the next class discussing it -- homework will be accepted up until a week after it is assigned, but we will still be discussing some of the problems the next day, so please be familiar with the problems. Each homework assignment will be worth 20 points.

**Exams:** dates to be determined

**Final Exam:** date: Monday, 14 December 2009 time: 10:15-12:15

**Extra Credit:** bonus questions, difficult homework questions, and potentially projects or written papers may be done for extra credit. It will be notified to you in class or e-mail about extra credit opportunities

**GRADING:** Grades will be determined by finding the total average of each daily quizzes, homeworks, and exams and then averaging those values and adding extra credit at the end. This final average will be your final grade percentage.

**NOTICE:** Makeup quizzes and exams will only be given for excused absences. Any excused absence must be verified according to the procedure in the Undergraduate Catalog. Please refer to page 124 of the Undergraduate Catalog ([http://www.marshall.edu/catalog/Undergraduate/ug\\_09-10.pdf](http://www.marshall.edu/catalog/Undergraduate/ug_09-10.pdf)). Please contact me in advanced whenever possible when an excused absence is expected to schedule a time for a makeup.

**Objectives of the course:** From the mathematics department's description... "A brief but careful review of the main techniques of algebra. Polynomial, rational, exponential, and logarithmic functions. Graphs, systems of equations and inequalities, sequences."

## Topics covered:

Set theory

The real number system

Integer exponents

Scientific notation

Order of operations

Operations with polynomials

Factoring

Radical exponents

Basic equation solving

Distance formula

Midpoint formula

Graphs of equations  
Circles

Definition of a function  
Domain and range  
Graphs of functions  
Linear functions  
Quadratic functions  
Polynomial functions  
Radical functions  
Rational functions  
Exponential functions  
Logarithmic functions

Curve fitting and regression models  
Increasing, decreasing, and constant functions  
Piecewise defined functions  
Operations with functions  
Composition of functions  
Even and odd functions  
Inverse functions  
Transformations of graphs and functions

Variation  
Maxima and minima  
Population growth  
Exponential decay  
Continuously compounded interest

Complex number system  
Inequalities  
Intermediate value theorem  
Remainder theorem  
Factor theorem  
Synthetic division  
Fundamental theorem of algebra  
Rational zeros theorem  
Descartes' rule of signs

Solving systems of linear equations graphically  
Substitution method  
Elimination method  
Gaussian elimination  
Gauss-Jordan elimination  
Matrix operations  
Inverse matrices  
Determinants  
Cramer's method