# Math 1710 College Algebra

**Course Description:** (3 credit hours.) Analysis of functions (linear, quadratic, polynomial, root, rational, exponential, logarithmic); partial fractions; conic sections; theory of equations; inequalities; applications.

**Combo sections:** These are special sections that meet 5 hours per week and are designated by an "E" in the section number. Combo sections have lower prerequisite requirements and cover some additional preparatory material. Combo sections still count as 3 credit hour courses, and completing a combo section is equivalent to completing a regular section as far as all degree and course prerequisite requirements.

**Prerequisites:** <u>ALEKS math assessment test</u>. An ALEKS score of 46–60 places you in regular sections of Math 1710. An ALEKS score of 30–45 places you in combo sections of Math 1710.

**Student population:** Lower Division Students. This course is a prerequisite for Elementary Calculus (<u>Math 1830</u>) and Trigonometry (<u>Math 1720</u>), and will fulfill a lower division mathematics requirement in some degree programs (confirm with your academic advisor). **Note:** only one of Math 1710 or <u>Math 1730</u> may be used to satisfy degree requirements.

**Course Objectives:** Unlike the official course description, Math 1710 does not cover partial fractions or conic sections. It does, however, introduce students to a library of function types (linear, quadratic, polynomial, root, rational, exponential and logarithmic). From this course, students are expected to be familiar with simplifying algebraic expressions, finding zeros of different function types, performing calculations based on formulas and interpret application problems as equations or inequalities.

#### Skills to be learnt:

- 1. Students should be able to solve and graph linear functions on the Cartesian plane as well as solve and graph linear inequalities on a number line.
- 2. Students should be able to calculate and interpret slope and find equations of lines.
- 3. Students should be able to perform arithmetic operations with functions and compute (and simplify) difference quotients and compositions of functions.
- 4. Students should be familiar with symmetry properties, even/odd functions and perform transformations (vertical shifts, horizontal shifts, etc.) of graphs.
- 5. Students should be able to perform arithmetic operations with complex numbers.
- 6. Students should be able to factor, use completing the square and the quadratic formula to solve and graph quadratic functions. This includes finding the vertex, axis of symmetry, etc.
- 7. Students should be able to solve rational, radical and absolute value equations along with absolute value inequalities.
- 8. Students should be able to graph simple polynomial and rational functions and find vertical and horizontal asymptotes.
- 9. Students should be familiar with polynomial division (synthetic) and the remainder theorem and factor theorem.
- 10. Students should be able to use the properties of logarithms and exponents to solve and graph exponential and logarithmic equations.
- 11. Students should be familiar with applications using exponential and logarithmic properties such as exponential growth and decay and compound interest.

**Method of Instruction:** This course is taught as a guided lecture, which means notes will be given in lecture format while examples will be worked with the help of the students in the class. Questions will be asked and are expected to be answered by the students in the class.

**Textbook:** College Algebra UofM Custom Edition with **MyMathLab** by Beecher, Penna, Bittinger. This will be shrink wrapped with *MML student access code*, which *cannot* be purchased online. The access code purchased with the book at The Tiger bookstore or on campus bookstore are the only access codes that will work.

#### Mymathlab plus tech support number: 844.292.7015

Mymathlab website: http://mymathlab.com/

**Graphing calculator** (if required by instructor): TI 83 Plus or TI 84 Plus or Silver Edition for classroom use. TI 89s and TI 92s are prohibited. Cell phones **cannot** be used as calculators.

**Tutoring:** Free tutoring is available through the University's Education Support Programs. They offer a drop-in tutoring service in the <u>Math Learning Center</u> in DH 341 and <u>online</u> <u>assistance</u>.

**Disabilities:** Any student who anticipates physical or academic barriers based on the impact of a disability should contact <u>Disability Resources for Students (DRS)</u> at 110 Wilder Tower, 901.678.2880 at the earliest opportunity. DRS coordinates access and accommodations for students with disabilities. You must give your instructor a copy of any accommodation memos provided by the DRS within the first week of class.

**Attendance:** Class attendance is important, every student is required to be in class, on time, and stay for the entire class period for each class session. If you miss a class, you are responsible for finding out what topics were covered and for completing any missed work.

**Drop / Withdraw:** Students who need to drop this class must report to the Office of the Registrar to initiate withdrawal procedures. Check <a href="http://www.memphis.edu/registrar/calendars/">http://www.memphis.edu/registrar/calendars/</a> for deadlines.

**Email Rules:** *All* email correspondence must be made through your <u>University of Memphis</u> email account. Check your email daily, and make sure that your "inbox" isn't so full that no new messages will get through. Please include your section number in your email.

**Grading Policy:** Grades will be calculated based on homework, quizzes, tests, and final exam. Grading scale is determined by the instructor.

**Homework:** Homework will be assigned for each section of the text, and must be finished before the due date for you to get credit.

**Quizzes & Tests:** There will be a number of quizzes/ tests for this course. You must be present in class to take each test.

**No Make-ups** for a missed homework, quiz, test, or final exam. If you must miss a test because of an official school function you may schedule to take the test at a time prior to the original test date. No other rescheduling will be allowed.

#### Final Schedule: see http://www.memphis.edu/registrar/calendars/

Academic Integrity: I encourage you to work with your classmates on homework or to have study groups for tests; however, letting someone else do all the work while you just sit back and copy will not help you on your tests. Copying the work of others is not going to help you understand the material or pass the course.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance will receive a zero, in addition to other possible disciplinary sanction which may be imposed through the regular institutional disciplinary procedures.

**Classroom Rule:** Silence cell phones and remove headphones when in the classroom. No eating or individual breaks will be allowed during the class period.

Course schedule: Any changes of this schedule will be announced in class, and in writing.

## **Chapter I: Graphs, Functions, and Models**

- Introduction to Graphing
- Functions and Graphs
- Linear Functions, Slope, and Applications
- Equations of Lines and Modeling
- Linear Equations, Functions, Zeros, and Applications
- Solving Linear Inequalities

# **Chapter 2: More on Functions**

- Increasing, Decreasing, and Piecewise Functions; Applications
- The Algebra of Functions
- The Composition of Functions
- Symmetry and Transformations
- Variation and Applications

## **Chapter 3: Quadratic Functions and Equations; Inequalities**

- The Complex Numbers.
- Quadratic Equations, Functions, Zeros, and Models
- Analyzing Graphs of Quadratic Functions
- Solving Rational Equations and Radical Equations
- Solving Equations and Inequalities with Absolute Value.

# **Chapter 4: Polynomial Functions and Rational Functions**

- Polynomial Functions and Models
- Graphing Polynomial Functions.
- Polynomial Division; The Remainder Theorem and the Factor Theorem
- Theorems about Zeros of Polynomial Functions
- Rational Functions
- Polynomial Inequalities and Rational Inequalities

# **Chapter 5: Exponential Functions and Logarithmic Functions**

- Inverse Functions
- Exponential Functions and Graphs
- Logarithmic Functions and Graphs
- Properties of Logarithmic Functions
- Solving Exponential Equations and Logarithmic Equations
- Applications and Models: Growth and Decay; Compound Interest