SYLLABUS FOR MATH 005 COLLEGE ALGEBRA I

FALL 2016

COURSE DESCRIPTION: This is an intensive college algebra course, with applications to the natural sciences. It begins with a review of algebraic manipulations, and then goes on to linear, quadratic, exponential, and logarithmic equations, to inequalities, functions and their graphs.

This course requires the following:

1) ALEKS, a software for which you need to purchase a student access code.

2) REQUIRED TEXT: College Algebra & Trigonometry, by Julie Miller and Donna Gerken, First Edition, January 2016, McGraw Hill. (The ebook and the ALEKS code are included in the cost of this course.)

COURSE GOALS:

- Involve students in meaningful and positive, intelectually engaging, mathematical experience
- Provide students with opportunities to analyze, synthesize and work collaboratively on explorations and reports
- Develop students' logical reasoning skills, needed by informed and productive citizens
- Strengthen students' algebraic and quantitative abilities useful in the study of other disciplines
- Develop students' mastery of those algebraic techniques necessary for problem-solving and mathematical modeling
- Improve students' ability to communicate mathematical ideas clearly in oral and written form
- Develop students' competence and confidence in their problem-solving ability
- Develop students' ability to use technology for understanding and doing mathematics
- Enable and encourage students to take additional coursework in the mathematical sciences

COURSE OBJECTIVES: On completion of the course, students should be able to

- perform basic algebraic manipulations
- solve linear, rational, quadratic equations and apply these to real life problems
- reduce certain equations to linear, rational, quadratic equations and apply these to real life problems
- solve linear inequalities in their various forms and apply these to real life problems
- solve problems involving complex numbers
- use rectangular coordinate systems and solve reasonably simple analytic geometric problems
- understand functions and relations, graph functions, interpret and analyze graphs, transform graphs, apply knowledge of functions to real life problems

- perform algebraic operations on functions
- understand and solve all problems pertaining to lines in the plane
- completely apply knowledge about linear functions to linear real life problems
- understand the exponential and logarithmic functions as mathematical objects
- perform mathematical manipulations of the exponential and logarithmic functions
- apply the exponential and logarithmic functions to various real life problems through modeling
- Solve some simple exponential and logarithmic equations

PREREQUISITE: A satisfactory grade in Basic Math II or a satisfactory score in the mathematics placement exam.

**COURSE CONTENT**

1. REVIEW OF PREREQUISITES
    a. Algebra and Real Numbers
    b. Exponents and Radicals
    c. Polynomials and Factoring
    d. Rational Expressions
2. EQUATIONS AND INEQUALITIES
    a. Linear Equations, Rational Equations and Applications
    b. Absolute Value Equations and Inequalities
    c. Complex Numbers
    d. Quadratic Equations and Applications
    e. Additional Equations and Applications
    f. Linear, Compound and Absolute value Inequalities
3. FUNCTIONS AND RELATIONS
    a. The Rectangular Coordinate System
    b. Circle
    c. Functions and Relations
    d. Linear Equations in Two variables and Linear Functions
    e. Applications of Linear Equations and Modeling
    f. Transformations of Graphs
    g. Analyzing Graphs of Functions and Piece-wise Defined Functions
    h. Algebra of Functions and Function Composition
4. EXPONENTIAL AND LOGARITHMIC FUNCTIONS
    a. Inverse Functions
    b. Exponential Functions
    c. Logarithmic Functions
    d. Properties of Logarithms
    e. Exponential and Logarithmic Equations and Applications
    f. Modeling with Exponential and Logarithmic Functions

Here is an approximate schedule of lectures:

| Month | Date | Sections | Homework --ALEKS |
|---|---|---|---|
| AUG | 22 | R.1 Sets and the Real Number Line | |
| AUG | 24 | R.2 Integer Exp & Scien. Not. | |
| AUG | 26 | R.3 Rational Exponents & Radicals | |
| AUG | 29 | R.3 & R.4 Polynomials & Multip | |
| AUG | 31 | R.4 & R.5 Factoring | |
| SEP | 2 | R.5 & R.6 Rational Expressions | |
| **SEP** | **5** | **Labor Day** | |
| SEP | 7 | R.6 Rational Expressions | |
| SEP | 9 | Review | |
| SEP | 12 | **Exam 1** | |
| SEP | 14 | 1.1 Linear and Rational Eqns | |
| SEP | 16 | 1.2 Applications Lin & Rat'l | |
| SEP | 19 | 1.3 Complex Numbers | |
| SEP | 21 | 1.4 Quadratic Equations | |
| **SEP** | **23** | **CONVOCATION DAY** | |
| SEP | 26 | 1.4 & 1.5 Applic quadratic | |
| SEP | 28 | 1.5 Applic Quadratic | |
| SEP | 30 | 1.6 More Eqns & Apps | |
| OCT | 3 | 1.7 Linear & Abs Val Inequl | |
| OCT | 5 | Review | |
| OCT | 7 | **Exam 2** | |
| **OCT** | **10** | **COLUMBUS DAY** | |
| OCT | 12 | 2.1 Rectangular Coords & Graph | |
| OCT | 14 | 2.2 Circles | |
| OCT | 17 | 2.3 Functions & Relations | |
| OCT | 19 | 2.4 Linear Eqns in 2 var & Fns | |
| OCT | 21 | 2.5 Apps Linear Eqns | |
| OCT | 24 | 2.6 Transformations of Graphs | |
| OCT | 26 | 2.7 Analysing Graphs | |
| OCT | 28 | 2.8 Algebra & Composition of Fns | |
| OCT | 31 | Review | |
| NOV | 2 | **Exam 3** | |
| NOV | 4 | 3.1 Quadratic Fns & Apps | |
| NOV | 7 | 4.1 Inverse Fns | |
| NOV | 9 | 4.2 Exponential Fns | |
| **NOV** | **11** | **VETERANS' DAY** | |
| NOV | 14 | 4.3 Logarithmic Fns | |
| NOV | 16 | 4.4 Properties of Logs | |
| NOV | 18 | 4.4 & 4.5 Exp & Log Eqns | |
| NOV | 21 | 4.5 & 4.6 Modeling | |
| NOV | 23 | 4.6 Modeling | (half day) |
| **NOV** | **25** | **THANKSGIVING HOLIDAY** | |
| NOV | 28 | 4.6 Modeling & Review | |
| **NOV** | 30 | **Exam 4** | |
| **DEC** | **6** | **FINAL EXAM 3:30-5:30** | **see old finals online**** |

**http://www.coas.howard.edu/mathematics/more_pexams.html

**CLASSROOM POLICIES:**

1. ***No cell phone or computer usage during class, including texting.*** Please turn your ringer off before the start of class and keep your laptop closed.
2. Research has shown that students who regularly attend class tend to do better than those who do not. Please be on time.
3. Please see your instructor for the classroom calculator policy. Some classes do not allow graphics calculators.

**Academic Code of Student** Conduct (please see the "Academic Code of Conduct" in the Howard University handbook or Directory of Classes): No copying, unauthorized use of calculators, books, or other materials, or changing of answers or other academic dishonesty will be tolerated.

**American Disabilities Act** (ADA): Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students who need accommodations because of a disability should contact Dr. Barbara Williams, Dean for Special Student Services (202-238-2420), as soon as possible after admission to the University or at the beginning of each semester.

**Statement on Interpersonal Violence:** Howard University takes sexual assault, dating violence, domestic violence, stalking and sexual harassment seriously. If a student reveals that he or she needs assistance with any of these issues, all responsible employees, including faculty, are required to share this information with the University Title IX Office (202-806-2550) or a student can be referred for confidential services to the Interpersonal Violence Prevention Program (IVPP) (202-238-2382) or the University Counseling Services (202-806-6870). For more information, please go to www.CampusSafetyFirst.Howard.Edu