COURSE SYLLABUS

Course Number: MAC 1105
Prerequisite(s): High School Algebra I & II
Course Credit: 3 hours
Course Title: College Algebra
College: Arts & Sciences
Department: Mathematics
Required Text(s): College Algebra custom version for FAMU with web access to www.MyMathLab.com
Supplies:
Faculty Name: Dr. Amal Aafif
Term and Year: Fall 2009
Place and Time:
Office Location:
Telephone:
e-mail:

Office Hours

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<th>Monday</th>
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Course Description

This course is designed to assist students in developing skills for solving functions and functional notation, operations on functions, inverse functions, linear, quadratic and rational functions, absolute value and radical functions, exponential and logarithmic growth and decay. In addition, students will investigate algebraic techniques, linear and quadratic equations, inequalities, complex numbers, systems of equations and inequalities, combinations and the Binomial Theorem. Also, students will examine domains of functions, ranges of functions, graphs of functions and relations.

Conceptual Framework

The Conceptual Framework in the Professional Education Unit (PEU) at Florida A&M University is an integrated approach to providing educational experiences that result in exemplary professional educators. The Framework is comprised of six themes with the mission of developing high quality classroom teachers, administrators and support personnel. The term “exemplary” refers to the kind of graduates the PEU strives to produce. The figure below provides a diagram of the Exemplary Professional Conceptual Framework.

The Conceptual Framework for the FAMU Professional Education Unit is grounded in a combination of directed, constructivist, developmental, and social learning theories derived form the writings of system theorists, educational philosophers, social scientists, practitioner and developmental theorists. Concepts from these writers and from the varied educational learned societies help form the knowledge base for the unit’s curriculum components and principles of its Conceptual Framework.

F=Florida Educator Accomplished Practices Standards (FEAPS)
I=Interstate New Teacher Assessment and Support Consortium Standards (INTASC)

(K)=Knowledge (S)=Skill (D)=Disposition

Approved/Revised 10/30/07
TECHNOLOGY

• CF 2
• Through this focal area, the FAMU professional education candidate will:

<table>
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<th>CF:</th>
<th>2.1 (S)</th>
<th>Use of available technology and software to support student learning.</th>
<th>F: 4,12</th>
<th>I: 6</th>
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<tr>
<td>CF:</td>
<td>2.3 (K)</td>
<td>Know fundamental concepts in technology.</td>
<td>F: 12</td>
<td>I: 1,6</td>
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<td>CF:</td>
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<td>Understand fundamental concepts in technology.</td>
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<td>CF:</td>
<td>2.5 (S)</td>
<td>Use fundamental concepts in technology.</td>
<td>F: 12</td>
<td>I: 6</td>
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Approved/Revised 10/30/07
CRITICAL THINKING

• CF4

• Through this focal area, the FAMU professional education candidate will:

| CF: 4.1 (K) | Understand a variety of instructional/professional strategies to encourage student development of critical thinking and performance. | F:4,7 | I: 4 |
| CF: 4.4 (K) | Acquire performance assessment techniques and strategies that measure higher order thinking skills of student. | F:1,4 | I: 1,8 |
| CF: 4.5 (S) | Demonstrate the use of higher order thinking skills. | F: 8 | I: 4 |

PROFESSIONALISM

• CF 5

• Through this focal area, the FAMU professional education candidate will:

| CF: 5.1 (K) | Know the content | F: 8 | I: 1 |

Overall Goals of the Course

The overall goals of the course are to develop the ability of the student to relate concepts of algebra to daily life and apply skills to practical applications, to build a solid foundation of knowledge and skills on which other mathematics can rely for enhancement and relevance, and to help students see more clearly the relationship between quantities and their cause and effect.

Specific Behavioral Objectives

To successfully complete College Algebra, the student will be required to meet the following objectives with at least 70% proficiency. At the end of the course the student will be able to:

1. identify functions and use functional notation
2. find the domain and range of a function
3. understand and use inverse functions
4. graph functions and relations
5. perform operations on functions
6. solve linear, quadratic and rational functions
7. understand and use absolute value and radical functions
8. know the properties of exponential and logarithmic functions
9. solve exponential and logarithmic functions
10. understand applications such as modeling, exponential and logarithmic growth and decay functions

National, State, and PEU Standards Addressed in the Course

Interstate New Teacher Assessment and Support Consortium (INTASC) Standards

Standard 1: Subject Matter

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.

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Standard 6: Communication
The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

Standard 8: Assessment
The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social and physical development of the learner.

Professional Organization/Learned Society Standards

NCATE/NCTM Program Standards for Secondary Mathematics:

Standard 1: Knowledge of Mathematical Problem Solving
Candidates know, understand, and apply the process of mathematical problem solving.

Standard 3: Knowledge of Mathematical Communication
Candidates communicate their mathematical thinking orally and in writing to peers, faculty, and others.

Standard 4: Knowledge of Mathematical Connections
Candidates recognize, use, and make connections between and among mathematical ideas and in contexts outside mathematics to build mathematical understanding.

Standard 5: Knowledge of Mathematical Representation
Candidates use varied representations of mathematical ideas to support and deepen students’ mathematical understanding.

Standard 6: Knowledge of Technology
Candidates embrace technology as an essential tool for teaching and learning mathematics.

Standard 9: Knowledge of Number and Operation
Candidates demonstrate computational proficiency, including a conceptual understanding of numbers, ways of representing number, relationships among number and number systems, and meanings of operations.

Standard 10: Knowledge of Different Perspectives on Algebra
Candidates emphasize relationships among quantities including functions, ways of representing mathematical relationships, and the analysis of change.

Florida Educator Accomplished Practices (FEAPs)

ASSESSMENT
The preprofessional teacher collects and uses data gathered from a variety of sources. These sources include both traditional and alternate assessment strategies. Furthermore, the teacher can identify and match the students’ instructional plans with their cognitive, social, linguistic, cultural, emotional, and physical needs.

COMMUNICATION
The preprofessional teacher recognizes the need for effective communication in the classroom and is in the process of acquiring techniques which she/he will use in the classroom.

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CRITICAL THINKING
The preprofessional teacher is acquiring performance assessment techniques and strategies that measure higher order thinking skills in students and is building a repertoire of realistic projects and problem-solving activities designed to assist all students in demonstrating their ability to think creatively.

KNOWLEDGE OF SUBJECT MATTER
The preprofessional teacher has a basic understanding of the subject field and is beginning to understand that the subject is linked to other disciplines and can be applied to real-world integrated settings. The teacher’s repertoire of teaching skills includes a variety of means to assist student acquisition of new knowledge and skills using that knowledge.

TECHNOLOGY
The preprofessional teacher uses technology as available at the school site and as appropriate to the learner. She/he provides students with opportunities to actively use technology and facilitates access to the use of electronic resources. The teacher also uses technology to manage, evaluate, and improve instruction.

Florida Teacher Certification Examination (FTCE) Subject Area Examination (SAE) Competencies and Skills

1 Knowledge of algebra
1. Identify graphs of linear inequalities on a number line.
2. Identify graphs of linear equations and inequalities in the coordinate plane.
3. Identify or interpret the slope and intercepts of a linear graph or a linear equation.
4. Determine the equation of a line, given the appropriate information such as two points, point-slope, slope-intercept, or its graph.
5. Solve problems involving the use of equations containing rational algebraic expressions.
6. Factor polynomials (e.g., the sum or difference of two cubes).
7. Rewrite radical and rational expressions into equivalent forms.
8. Perform the four basic operations on rational and radical expressions.
9. Solve equations containing radicals.
10. Multiply or divide binomials containing radicals.
11. Solve quadratic equations by factoring, graphing, completing the square, or using the quadratic formula, including complex solutions.
13. Use the discriminant to determine the nature of solutions of quadratic equations.
14. Determine a quadratic equation from known roots.
15. Identify the graphs of quadratic inequalities.
17. Solve systems of linear equations or inequalities.
18. Formulate or identify systems of linear equations or inequalities to solve real-world problems.
19. Solve equations or inequalities involving absolute value.
20. Expand given binomials to a specified positive integral power.
21. Determine a specified term in the expansion of given binomials.
22. Solve polynomial equations by factoring.
23. Perform vector addition, subtraction, and scalar multiplication on the plane.
24. Solve real-world problems involving ratio or proportion.

2 Knowledge of functions
1. Interpret the language and notation of functions.
2. Determine which relations are functions, given mappings, sets of ordered pairs, rules, and graphs.
3. Identify the domain and range of a given function.
4. Identify the graph of special functions (i.e., absolute value, step, piecewise, identity, constant function).
5. Find specific values of a given function.
6. Estimate or find the zeros of a polynomial function.
7. Identify the sum, difference, product, and quotient of functions.

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8. Determine the inverse of a given function.
9. Determine the composition of two functions.
10. Determine whether a function is symmetric, periodic, or even/odd.
11. Determine the graph of the image of a function under given transformations (i.e., translation, rotations through multiples of 90 degrees, dilations, and/or reflections over y=x horizontal or vertical lines).

**11 Knowledge of mathematics as communication**
1. Identify statements that correctly communicate mathematical definitions or concepts.
2. Interpret written presentations of mathematics.

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<th>Assignment</th>
<th>Behavioral objectives</th>
<th>INTASC Standards</th>
<th>Professional Organization</th>
<th>FEAPs</th>
<th>FTCE SAE</th>
<th>PEU Conceptual Framework</th>
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3. Select or interpret appropriate concrete examples, pictorial illustrations, and symbolic representations in developing mathematical concepts.

**13 Knowledge of mathematical connections**
1. Identify equivalent representations of the same concept or procedure (e.g., graphical, algebraic, verbal, numeric).

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### Teaching Methods

Teaching method will be lecture.

### Course Evaluation

Your course grade will be:

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<th>Component</th>
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<td>Four Tests</td>
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<td>MyMathLab Homework</td>
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<td>MyMathLab Quizzes</td>
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<td>Class work &amp; Attendance</td>
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### Grading

The scale will be:

- A ➔ at least 90%
- B ➔ 80-89%
- C ➔ 70-79%
- D ➔ 60-69%
- F ➔ less than 60%

### Course Policies

**Policy Statement on Non-Discrimination** It is the policy of Florida Agricultural and Mechanical University to assure that each member of the University community be permitted to work or attend classes in an environment free from unlawful discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or genetic information. The University also prohibits retaliation against any individual who reports, participates in an investigation of, or testifies about any discrimination.

(K)=Knowledge (S)=Skill (D)=Disposition

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environment free from any form of discrimination including race, religion, color, age, disability, sex, marital status, national origin, veteran status and sexual harassment as prohibited by state and federal statutes. This shall include applicants for admission to the University and employment.

**Academic Honor Policy** The University’s Academic Honor Policy is located in the FANG Student Handbook, under the Student Code of Conduct- Regulation 2.012 section, beginning on page 55-56.

**ADA Compliance** To comply with the provisions of the Americans with Disabilities Act (ADA), please advise instructor of accommodations required to insure participation in this course. Documentation of disability is required and should be submitted to the Learning Development and Evaluation Center (LDEC). For additional information please contact the LDEC at (850) 599-3180.

**References**


www.coursecompass.com

www.ncate.org

www.fldoe.org

**Tentative Course Calendar**

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**FINAL EXAM**

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All tests, quizzes, and other papers that are turned in to be graded will be in pencil. Any paper turned in that is not in pencil will NOT be graded.

**F=Florida Educator Accomplished Practices Standards (FEAPS)**
**I=Interstate New Teacher Assessment and Support Consortium Standards (INTASC)**

(K)=Knowledge  (S)=Skill  (D)=Disposition

*Approved/Revised 10/30/07*