COURSE SYLLABUS

Course Number: MAC2312
Prerequisite(s): MAC 2311
Course Title: Calculus II
Course Credit: 4
Course Hours: Lecture 4 hours
College: Arts & Sciences
Department: Mathematics
Faculty Name: Dr. Kbenesh Blayneh
Required Text(s): Thomas’ Calculus by Weir, Hass
Supplies: web access to www.MyMathLab.com for homework, quizzes
Term and Year: Spring 2009
Place and Time:
Office Location: Jackson-Davis Hall, 304
Telephone: (850) 412-5228
e-mail: kbenesh.blayneh@famu.edu

Office Hours | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday
--- | --- | --- | --- | --- | --- | ---

Course Description
This course is designed to assist students in developing skills for solving problems that include techniques of integration, further applications of integration, and sequences and series. In addition, students will investigate the application of the definite integral, conic sections, and polar coordinates.

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>
<thead>
<tr>
<th>CF: 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>
</tr>
</thead>
<tbody>
<tr>
<td>CF: 2.3 (K)</td>
<td>Know fundamental concepts in technology.</td>
<td>F: 12</td>
<td>I: 1,6</td>
</tr>
<tr>
<td>CF: 2.4 (K)</td>
<td>Understand fundamental concepts in technology.</td>
<td>F: 2,12</td>
<td>I: 6</td>
</tr>
<tr>
<td>CF: 2.5 (S)</td>
<td>Use fundamental concepts in technology.</td>
<td>F: 12</td>
<td>I: 6</td>
</tr>
</tbody>
</table>

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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 necessary skills for solving definite and indefinite integrals and to understand their applications in science and engineering, to develop the skills necessary for determining when a sequence/series converges and to use this skill in the approximation of functions, and to help students see more clearly the relationship between polar and rectangular coordinate systems and the usefulness of polar coordinates in solving problems in science and engineering.

Specific Behavioral Objectives

To successfully complete Calculus II, 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. integrate functions using tables; u-substitutions; by parts; trigonometric identities and substitutions; partial fractions; numerical techniques.
2. evaluate improper integrals
3. apply techniques of integration to solving separable differential equations.
4. apply techniques of integration to calculate area; volume; surface area; arc length; work; and fluid pressure
5. define a sequence and understand the definition for convergence/divergence
6. define a series and determine its convergence/divergence using the integral; comparison, ration and root; and the alternating series tests.
7. determine if a series converges absolutely or conditionally
8. define a power series and determine its radius of convergence
9. find the Taylor /Maclaurin Series for a particular function and determine the interval of convergence and estimate the accuracy of the approximations
10. utilize Taylor Series to compose functions, differentiate functions and integrate
11. determine and sketch a conic section give a quadratic equation
12. convert points and functions from rectangular to polar coordinates
13. know and be able to sketch simple polar graphs
14. calculate the area and surface area using polar coordinates

National, State, and PEU Standards Addressed in the Course

Interstate New Teacher Assessment and Support Consortium (INTASC) Standards

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**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.

**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 12: Knowledge of Calculus**
Candidates demonstrate a conceptual understanding of limit, continuity, differentiation, and integration and a thorough background in the techniques and application of the calculus.

**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.

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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.

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

8 Knowledge of discrete mathematics
3. Determine the sum of terms in an arithmetic or geometric progression.

9 Knowledge of calculus
13. Find antiderivatives for algebraic, trigonometric, exponential, and logarithmic functions.
15. Evaluate an integral by use of the fundamental theorem of calculus.

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

Teaching method will be lecture.

<table>
<thead>
<tr>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Problem Set (Class Work)</td>
<td>Find anti-derivatives for algebraic, trigonometric, exponential, and logarithmic functions</td>
<td>INTASC: 1.0, 8.0</td>
<td>NCTM: 1.1, 1.3, 3.2, 4.1, 12.1</td>
<td>FEAPs: 1.1, 4.1, 4.1a, 4.1d, 4.1g, 8.1, 8.1a, 8.1b</td>
<td>FTCE: 9.13, 11.1, 11.2, 12.1</td>
<td>CF 4.1, CF 4.3, CF 4.5, CF 5.1</td>
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<tr>
<td>Mathematical Problem Set (Class Work 1)</td>
<td>Determine the sum of terms in an arithmetic progression</td>
<td>INTASC: 1.0, 8.0</td>
<td>NCTM: 1.1, 1.3, 3.2, 4.1, 12.1</td>
<td>FEAPs: 1.1, 4.1, 4.1a, 4.1d, 4.1g, 8.1, 8.1a, 8.1b</td>
<td>FTCE: 8.3, 11.1, 11.2, 12.1</td>
<td>CF 4.1, CF 4.3, CF 4.5, CF 5.1</td>
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<tr>
<td>Mathematical Problem Set (Class Work 8)</td>
<td>Determine the sum of terms in a geometric progression</td>
<td>INTASC: 1.0, 8.0</td>
<td>NCTM: 1.1, 1.3, 3.2, 4.1, 12.1</td>
<td>FEAPs: 1.1, 4.1, 4.1a, 4.1d, 4.1g, 8.1, 8.1a, 8.1b</td>
<td>FTCE: 8.3, 11.1, 11.2, 12.1</td>
<td>CF 4.1, CF 4.3, CF 4.5, CF 5.1</td>
</tr>
</tbody>
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**Course Evaluation**

Your course grade will be:
Four Tests                        45%
MyMathLab Homework               8%
MyMathLab Quizzes                8%
Class work including quizzes     4%
Projects                         15%
Final Examination                20%

**Grading**

The scale will be
A → at least 90% ;
B → at least 80% but less than 89%;
C → at least 70% but less than 79%;
D → at least 60% but less than 69%;
F → fewer than 60%

**Course Policies**

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**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 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**

<table>
<thead>
<tr>
<th></th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
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<tbody>
<tr>
<td>week 1</td>
<td>6-Jan</td>
<td>7-Jan</td>
<td>8-Jan</td>
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<td>week 2</td>
<td>12-Jan</td>
<td>13-Jan</td>
<td>14-Jan</td>
<td>15-Jan</td>
<td>16-Jan</td>
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<td>week 3</td>
<td>M. L. King. Jr.</td>
<td>20-Jan</td>
<td>21-Jan</td>
<td>22-Jan</td>
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<td>week 4</td>
<td>Test 1 26-Jan</td>
<td>27-Jan</td>
<td>28-Jan</td>
<td>29-Jan</td>
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<td>week 5</td>
<td>2-Feb</td>
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<td>4-Feb</td>
<td>5-Feb</td>
<td>6-Feb</td>
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<td>week 6</td>
<td>9-Feb</td>
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<td>11-Feb</td>
<td>12-Feb</td>
<td>13-Feb</td>
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<td>week 7</td>
<td>Test 2 16-Feb</td>
<td>17-Feb</td>
<td>18-Feb</td>
<td>19-Feb</td>
<td>20-Feb</td>
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<td>week 8</td>
<td>23-Feb</td>
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<td>26-Feb</td>
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<td>week 9</td>
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<td>3-Mar</td>
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<td>5-Mar</td>
<td>6-Mar</td>
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<td>week 10</td>
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<td>week 12</td>
<td>23-Mar</td>
<td>24-Mar</td>
<td>25-Mar</td>
<td>26-Mar</td>
<td>Last Day &quot;W&quot;</td>
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<td>week 13</td>
<td>30-Mar</td>
<td>31-Mar</td>
<td>1-Apr</td>
<td>2-Apr</td>
<td>3-Apr</td>
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<td>week 14</td>
<td>6-Apr</td>
<td>7-Apr</td>
<td>8-Apr</td>
<td>9-Apr</td>
<td>10-Apr</td>
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<td>week 15</td>
<td>Test 4 13-Apr</td>
<td>14-Apr</td>
<td>15-Apr</td>
<td>16-Apr</td>
<td>17-Apr</td>
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<tr>
<td>week 16</td>
<td>20-Apr</td>
<td>21-Apr</td>
<td>22-Apr</td>
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