

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: MAC 2313

COURSE TITLE: Calculus with Analytic Geometry III

PREREQUISITE(S): MAC 2312 with a grade of "C" or better

COREQUISITE(S): None

CREDIT HOURS: 4

CONTACT HOURS/WEEK: 4

CONTACT HOUR BREAKDOWN:

Lecture/Discussion:	4
Laboratory:	
Other _____:	

FACULTY WORKLOAD POINTS: 4

STANDARDIZED CLASS SIZE ALLOCATION: 25

CATALOG COURSE DESCRIPTION: This is the third course in the calculus with analytic geometry sequence. Topics included in this course are polar coordinates, parametric equations, vectors in two and three dimensions, calculus of functions of several variables, multiple integrals with applications, and Green's and Stokes' Theorems. Four contact hours. A.A., A.S., A.A.S.

SUGGESTED TEXT(S): Calculus, Early Transcendental Functions, latest edition, Larson et al. ISBN 0-618-60624-6.

Calculus: Early Transcendentals Single and Multivariable, Latest Edition **NEW**

Anton, Bivens, Davis, ISBN 0-471-47244-1, © 2005  
Calculus Early Transcendentals, Latest Edition, Varberg, Purcell & Rigdon © 2007 | Prentice Hall | Cloth; 880 | Instock ISBN-10: 0131875337 | ISBN-13: 9780131875333

IMPLEMENTATION DATE: November 16, 1987

REVIEW OR MODIFICATION DATE: Fall Term, 2000  
 Fall Term, 2002 (20031)  
 Spring Term, 2005 (20052)  
 Fall Term, 2007 (20081)  
 Fall Term 2008 (20091) - Outline Review 2007

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Polar Coordinates and Parametric Equations	12
II. Vectors	16
A. Vectors in 2-space	
B. Vectors in 3-space	
C. Vector-valued functions	
D. Surfaces in 3-space	
III. Calculus of functions of several variables	14
A. Functions of several variables	
B. Limits and continuity	
C. Partial differentiation	
D. Chain rule and directional derivatives	
E. Tangent planes and normal lines	
IV. Multiple Integrals	14
A. Double integrals	
B. Double integrals in polar coordinates	
C. Surface area	
D. Volume under a surface	
E. Change of variables	
F. Iterated integrals	
G. Triple integrals	
H. Triple integrals in cylindrical and spherical coordinates	
V. Green and Stokes - discussion	4



NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

Section 1 COURSE PREFIX AND NUMBER: <u>MAC 2313</u>	SEMESTER CREDIT HOURS: <u>4</u>
COURSE TITLE: <u>Calculus with Analytic Geometry III</u>	

Section 2

TYPE OF COURSE: (Click on the box to check all that apply)

<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other _____		
<input checked="" type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		

Section 3 (If applicable)

INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

<input type="checkbox"/> Communication	<input type="checkbox"/> Social & Behavioral Sciences	<input checked="" type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

Section 4

INTELLECTUAL COMPETENCIES:

<input type="checkbox"/> Reading	<input type="checkbox"/> Speaking	<input type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry
<input type="checkbox"/> Writing	<input type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input type="checkbox"/> Ethical Judgment	<input type="checkbox"/> Working Collaboratively

Section 5	METHOD OF ASSESSMENT
LEARNING OUTCOMES	METHOD OF ASSESSMENT
<ul style="list-style-type: none"> <li>• An appreciation of mathematics</li> </ul>	Students will show an appreciation of mathematics through homework, instructor observation, class discussions and assignments, and frequent exams.
<ul style="list-style-type: none"> <li>• Confidence in abilities to learn and use mathematics</li> </ul>	Students will show more confidence in their abilities in mathematics through homework, instructor observation, class discussions and assignments, and frequent exams.
<ul style="list-style-type: none"> <li>• A positive attitude towards mathematics</li> </ul>	Students will demonstrate a positive attitude toward mathematics on homework, instructor observation, class discussions and assignments, and frequent exams.
<ul style="list-style-type: none"> <li>• Critical thinking skills</li> </ul>	Students will demonstrate critical thinking skills by solving problems on homework, instructor observation, class discussions and assignments, and frequent exams.
<ul style="list-style-type: none"> <li>• The successful student has reliably demonstrated the ability to:</li> </ul>	
<ul style="list-style-type: none"> <li>• Convert from polar to rectangular coordinates, and from rectangular to polar coordinates</li> </ul>	
<ul style="list-style-type: none"> <li>• Graph a function defined using polar coordinates</li> </ul>	

## Section 5 (Continued)

<b>Section 5</b>		
<b>LEARNING OUTCOMES</b>		<b>METHOD OF ASSESSMENT</b>
•	Calculate the area of a region defined by polar coordinates	
•	Graph curves defined by parametric equations	
•	Calculate arc length of a curve defined by parametric equations	
•	Demonstrate understanding of vectors in 2 and 3 dimensions	
•	Show familiarity with vector valued functions	
•	Draw surfaces in 3 dimensions	
•	Work with functions of several variables	
•	Calculate limits of functions of several variables	
•	Understand continuity of functions of several variables	
•	Calculate partial derivatives of functions of several variables	
•	Apply the chain rule to functions of several variables	
•	Calculate directional derivatives and gradients using functions of several variables	
•	Find tangent planes to surfaces defined by functions of several variables	
•	Find normal lines to surfaces defined by functions of several variables	
•	Calculate the value of double integrals in rectangular and polar coordinates	
•	Calculate surface area and volume under a surface	
•	Change from rectangular to cylindrical or spherical coordinates	
•	Understand how to evaluate iterated and triple integrals	
•	Evaluate triple integrals using spherical and cylindrical coordinates	
•	Demonstrate ability to evaluate line integrals	
•	Demonstrate familiarity with Green's Theorem and Stokes' Theorem	

## Section 6

Name of People Completing This Form: Alfred K. Mulzet, Co-Chair, Matthew Mitchell, Co-Chair, Nick Belloit, Anne Landry, Paula Risko

**SECTION 7 MUST BE COMPLETED FOR ALL GENERAL EDUCATION COURSES.**

Section 7	Primary	Secondary	N/A	VALUE	Primary	Secondary	N/A
KNOWLEDGE							
A. Global and Historical Knowledge & Understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intellectual honesty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends a general knowledge of the nature, origins and contributions of major civilizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curiosity and openness to new ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends the workings and interrelations of personal, business and government economies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recognition of one's own creative potential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends political, social and economic systems and their effects upon society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acceptance of and respect for differences among people and cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Cultural and Aesthetic Knowledge and Understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the contributions of the arts and humanities to the human experience on a personal, national or global level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Civic Engagement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends the historical development of the arts and sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lifelong Learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Comprehends religious and cultural systems and their effects upon society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
C. Human Awareness and Understanding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the dynamics of human behavior and the process of increasing self-awareness, growth and development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the stages of human development and the dynamics of human relationships in diverse cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the factors that promote physical, mental and social well-being	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
D. Mathematics, Science and Technology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the basic concepts and investigative processes of the natural sciences	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the breadth, significance and development of the mathematical sciences	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
• Comprehends the ways science and technology have shaped and continue to reshape human cultures and the environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				