

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: MAC 2312

COURSE TITLE: Calculus with Analytic Geometry II

PREREQUISITE(S): MAC 2311 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 second course of the three-course calculus sequence. It is a continuation of a study of techniques for integration of algebraic, trigonometric and transcendental functions, applications of integration techniques, differentiation and integration of inverse trigonometric and hyperbolic functions, L'Hopital's Rule, indeterminate forms and improper integrals, and sequences and series.

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, 2002 (20031)
 Spring Term, 2005 (20052)
 Fall Term 2008 (20091) - Outline Review 2007

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Review of differentiation and integration	4
II. Differentiation and integration of Inverse Trigonometric and Hyperbolic functions	8
III. More applications of integration	12
A. Volumes by shells and disks	
B. Arc length	
C. Work	
D. Fluid force	
E. Centroids and moments	
IV. Techniques of integration	20
A. Review of u-substitution	
B. Integration by parts	
C. Trigonometric integrals	
D. Trig substitutions	
E. Partial fractions	
F. L'Hopital's Rule	
G. Indeterminate forms	
H. Improper Integrals	
V. Sequences and Series	16



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 2312</u>	SEMESTER CREDIT HOURS: <u>4</u>
COURSE TITLE: <u>Calculus with Analytic Geometry II</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 LEARNING OUTCOMES	METHOD OF ASSESSMENT
• An appreciation of mathematics	Students will show an appreciation of mathematics through homework, instructor observation, class discussions and assignments, and frequent exams.
• Confidence in abilities to learn and use mathematics	Students will show more confidence in their abilities in mathematics through homework, instructor observation, class discussions and assignments, and frequent exams.
• A positive attitude towards mathematics	Students will demonstrate a positive attitude toward mathematics on homework, instructor observation, class discussions and assignments, and frequent exams.
• Critical thinking skills	Students will demonstrate critical thinking skills by solving problems on homework, instructor observation, class discussions and assignments, and frequent exams.
• The successful student has reliably demonstrated the ability to:	
• Demonstrate an understanding of topics covered in MAC 2311	
• Differentiate inverse trigonometric functions	
• Differentiate hyperbolic functions	
• Integrate inverse trigonometric functions	
• Integrate hyperbolic functions	
• Calculate volumes of solids of revolution using disc, shell and washer methods	

Section 5 (Continued)

Section 5 LEARNING OUTCOMES		METHOD OF ASSESSMENT
•	Calculate the arc length of the graph of a function	
•	Calculate the work done by a force	
•	Calculate the force exerted by a fluid	
•	Calculate the centroid of a region defined by functions	
•	Demonstrate familiarity with u-substitution	
•	Demonstrate competency using integration by parts	
•	Evaluate trigonometric integrals	
•	Evaluate integrals using trigonometric substitution	
•	Evaluate integrals using partial fractions	
•	Calculate limits involving indeterminate forms using L'Hopital's Rule	
•	Evaluate improper integrals	
•	Demonstrate familiarity with notation for terms of a sequence	
•	Understand the limit of a sequence and how to calculate it	
•	Understand the difference between convergent and divergent sequences	
•	List the terms of a sequence given a formula for the nth term	
•	Understand monotonic and bounded sequences	
•	Use L'Hopital's Rule to calculate the limit of a sequence	
•	Understand and apply theorems relating to the existence of limits of sequences	
•	Demonstrate familiarity with notation for finite and infinite series	
•	Understand the concept of a sequence of partial sums	
•	Understand the difference between convergent and divergent series	
•	Utilize a telescoping series to evaluate the sum of an infinite series	
•	Identify a geometric series and find its sum	
•	Understand and apply theorems relating to the sum of infinite series	
•	Use the integral test, p-series and harmonic series to establish the convergence or divergence of a series	
•	Use the comparison test and limit comparison test to establish the convergence or divergence of a series	
•	Determine the convergence or divergence of an alternating series	
•	Understand the difference between absolute and conditional convergence of an infinite series	
•	Use the Ratio and Root tests to establish the convergence or divergence of an infinite series	
•	Calculate the nth term of a Taylor or Maclaurin series	
•	Calculate Taylor and Maclaurin polynomials	
•	Use Taylor or Maclaurin polynomials to approximate the value of functions	
•	Understand power series, radius of convergence, and interval of convergence of power series	
•	Differentiate and integrate power series	
•	Find a geometric power series that represents a function	
•	Perform operations with power series	

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 KNOWLEDGE	Primary	Secondary	N/A	VALUE	Primary	Secondary	N/A
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"/>				