

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: MAC 1147

COURSE TITLE: Precalculus Algebra and Trigonometry

PREREQUISITE(S): MAC 1105 with a grade of "B" or better and high school trigonometry or satisfactory score on the placement test.

COREQUISITE(S): None

CREDIT HOURS: 5

CONTACT HOURS/WEEK: 5

CONTACT HOUR BREAKDOWN:

Lecture/Discussion:	5
Laboratory:	
Other: _____:	

FACULTY WORKLOAD POINTS: 5

STANDARDIZED CLASS SIZE ALLOCATION: 27

CATALOG COURSE DESCRIPTION:

This course is designed to prepare students for MAC 2311 and subsequent calculus courses. Topics include polynomial, radical, exponential, logarithmic, trigonometric and inverse trigonometric functions. Also included are graphs, trigonometric identities, solutions of triangles, matrices and determinants; sequence and series, binomial theorem, mathematical proof, complex numbers, conic sections and polar coordinates.

SUGGESTED TEXT(S):

Dwyer, Pre-Calculus w/CD, ISBN# 0-53-435287-1

Dugoppolski, Pre-Calculus w/SSM, CD Rom & MML, ISBN# 0-32-149872-0

Dugopolski, Pre-Calculus w/SSM, ISBN# 0-32-149892-5

Sullivan, Pre-Calculus w/Applications: Brief Version (w/MML, SSM, DVT & Graphing Calendar), ISBN # 0-13-223663X

Barnett, Student Study Pack Pre-Calculus, ISBN# 0-07-331263-0

Aufmann, Essen of Pre-Calculus, ISBN# 0-61-84470-4

IMPLEMENTATION DATE:

Fall Term, 2000

REVIEW OR MODIFICATION DATE:

Fall Term, 2003 (20041)

Spring Term, 2005 (20052)

Fall Term, 2006 (20061)

Fall Term, 2008 (20091) - Outline Review 2007

COURSE TOPICS	<u>CONTACT HOURS PER TOPIC</u>
I. Review of Algebraic Techniques	4
A. Exponents, Radicals, Complex Numbers, and Absolute Value	
B. Equations and Inequalities	
1. Polynomial Inequalities	
2. Rational Inequalities	
II. Relations, Functions, and Graphs	8
A. Functions and Their Graphs	
1. Properties of Functions	
2. Polynomial Functions	
3. Rational Functions	
4. Inverse Functions	
5. Piece-Wise Defined, Greatest Integer	
B. Algebra of Functions	
C. Graphing	
1. Methods	
2. Linear Equations and Inequalities	
3. Conic Sections	
D. Variation	
E. Translations	
III. Exponential and Logarithmic Functions	6
A. Exponential Functions	
B. Logarithmic Functions	
C. Natural and Common Logarithmic Equations	
D. Exponential and Logarithmic Equations	
E. Applications	
IV. Systems of Equations and Inequalities	4
A. Linear Systems of Equations	
B. Linear Systems of Inequalities	
C. Nonlinear Systems	
D. Partial Fractions	

COURSE TOPICS (CONTINUED)		<u>CONTACT HOURS PER TOPIC</u>
V.	Matrices and Determinants	6
	A. Gauss-Jordan Method	
	B. Matrix Algebra	
	C. Inverses of Square Matrices	
	D. Solving Matrices Using Technology	
VI.	Higher Degree Polynomials and Equations	8
	A. Remainder, Factor, and Rational Root Theorems	
	B. Synthetic Division	
	C. Roots of Higher Degree Polynomial Equations	
	D. Fundamental Theorem of Algebra	
VII.	Sequences, Series, the Binomial Theorem, and Mathematical Induction	8
	A. Summation Notation	
	B. Arithmetic and Geometric Sequences And Series	
	C. Binomial Theorem	
	D. Mathematical Induction	
VIII.	Theory of Circular Functions	7
	A. Angles and Units of Measure	
	B. Angles in Standard Position	
	C. Trigonometric Functions on a Unit Circle	
	D. Applications	
IX.	Graphs of Trigonometric Functions	7
	A. Sine, Cosine, Tangent, Cotangent, Secant, and Cosecant	
	B. Amplitude, Period, and Phase Shifts	
	C. Graphing Techniques	
X.	Trigonometric Identities and Equations	9
	A. Fundamental Identities	
	B. Proving Identities	
	C. Double Angle and Half Angle Identities	

COURSE TOPICS (CONTINUED)	<u>CONTACT HOURS PER TOPIC</u>
D. Product and Sum Identities E. Inverse Functions F. Trigonometric Equations	
XI. Solving Triangles	4
A. Right Triangle B. Law of Sines C. Law of Cosines	
XII. Complex Numbers and Polar Coordinates	4
A. Graphical Representation B. Trigonometric Form C. DeMoivre's Theorem (<u>Optional</u>) D. Polar Coordinates	



Course Prefix and Number: MAC1147	Semester Credit Hours: 5
Course Title: Precalculus Algebra and Trigonometry (Page 1 of 2)	

Discipline Area for the Course:

<input type="checkbox"/> Communication	<input checked="" type="checkbox"/> Mathematics	<input type="checkbox"/> Social & Behavioral Sciences
<input type="checkbox"/> Humanities & Visual/Performing Arts	<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Other-Designated Option

INTELLECTUAL COMPETENCIES:

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

Learning Outcomes		Method Of Assessment
	The students will be able to:	Students demonstrate analytical reasoning skills by solving problems on tests, class assignments, and projects.
1	Identify trigonometric and circular functions.	Students demonstrate critical thinking skills by solving problems on tests, class assignments, and projects.
2	Solve trigonometric equations using right triangles, laws of sine and cosine, and to use this information to solve application problems.	Students utilize a variety of approaches when solving mathematical problems including analytical, numerical, and computer/graphing calculator procedures.
3	Solve trigonometric identities.	Students demonstrate knowledge of the connection between mathematical principles and real-world problems.
4	Graph trigonometric functions.	Students are successful in the subsequent calculus and/or scientific courses which utilize the trigonometric functions and their properties.
5	Determine inverse trigonometric functions and solve trigonometric equations.	
6	Perform operations with complex numbers.	
7	Use polar coordinates to demonstrate polar graphing.	
8	Solve parametric equations.	
9	Use vectors to solve problems that involve vector applications.	



Course Prefix and Number: MAC1147	Semester Credit Hours: 5
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INTELLECTUAL COMPETENCIES:

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	Learning Outcomes	Method Of Assessment
1	10. Simplify algebraic expressions and solve algebraic equations and inequalities.	Included above.
2	11. Represent relationships between two variables symbolically.	
3	12. Interpret and draw inferences from mathematical models such as formulas, graphs and tables.	
4	13. Solve systems of linear and nonlinear equations and solve applications involving linear programming.	
5	14. Solve higher degree polynomial equations and graph polynomial functions. 15. Simplify and solve exponential and logarithmic equations. Interpret and draw inferences from the graphs of exponential and logarithmic equations.	
6	16. Use matrix algebra to solve linear and nonlinear systems of equations.	
7	17. Determine basic sequences and series including arithmetic and geometric sequences and series.	
8	18. Demonstrate comprehension of the Binomial Theorem.	
9	19. Use techniques of mathematical proof.	

Name of Person Completing This Form: **Pierre Satkowiak, Phil Petersen**

Signature: _____ Date: **02/06/2004**



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Discipline Area for the Course:

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INTELLECTUAL COMPETENCIES:					
<input checked="" type="checkbox"/> Reading	<input type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry	
<input type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively	
KNOWLEDGE			Primary	Secondary	N/A
			Primary	Secondary	N/A
A. Global and Historical Knowledge & Understanding					
• Comprehends a general knowledge of the nature, origins and contributions of major civilizations					
• Comprehends the workings and interrelations of personal, business and government economies				X	
• Comprehends political, social and economic systems and their effects upon society					X
B. Cultural and Aesthetic Knowledge and Understanding					
• Comprehends the contributions of the arts and humanities to the human experience on a personal, national or global level					
• Comprehends the historical development of the arts and sciences				X	
• Comprehends religious and cultural systems and their effects upon society					
C. Human Awareness and Understanding					
• Comprehends the dynamics of human behavior and the process of increasing self-awareness, growth and development					
• Comprehends the stages of human development and the dynamics of human relationships in diverse cultures					
• Comprehends the factors that promote physical, mental and social well-being					
D. Mathematics, Science and Technology					
• Comprehends the basic concepts and investigative processes of the natural sciences				X	
• Comprehends the breadth, significance and development of the mathematical sciences			X		
• Comprehends the ways science and technology have shaped and continue to reshape human cultures and the environment				X	

Name of Person Completing This Form: Pierre Satkowiak, Phil Petersen
 Signature: _____ Date: 02/06/2004
 GERckSht.ks Rev 12/10/02

