INCARNATE WORD Academy
A COLLEGE PREPARATORY HIGH SCHOOL FOR YOUNG WOMEN

Honors Pre-Calculus/Trig
ACP through UMSL
Math 1045/MOTR MATH 150
Course Syllabus 2018-2019

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Optional College Credit for this course:

Five (5) hours of college credit is available to students who meet the criteria for dual credit at the University of Missouri St. Louis. When you successfully complete this course with a "C" or above you will have earned five (5) college credit hours if you have enrolled with the University of Missouri St. Louis. Please visit the UMSL Advanced Credit website http://umsl.edu/acp for criteria, current prices and registration.

Fall registration closes SEPTEMBER 14, 2018.

You should check with receiving schools as to whether they accept this transfer credit. It is always up to the receiving institution as to whether credit will be accepted for transfer credit or not. Registration for UMSL credit for this course takes place online and is subject to very strict deadlines. These deadlines are set by the university and required by the Coordinating Board for Higher Education (CBHE). Credit must be paid for during the semester the student is enrolled in the class. Retroactive credit cannot be granted.

UMSL Course Description

Math 1045: Topics in this course include factoring, simplifying rational functions, functions and their graphs, solving linear and nonlinear equations, polynomial functions, inverse functions, logarithms, exponentials, solutions to systems of equations using matrices, solutions to nonlinear systems of equations, and sequences. Students will also study trigonometric and inverse trigonometric functions with emphasis on trigonometric identities and equations, and they will study vectors and polar coordinates.

Resources/Materials used for this course:

- Textbook: *Pearson: Sullivan – Precalculus, 10th Edition*
- Web pages: MathXLforSchool.com, classroom.google.com, edpuzzle.com, desmos.com/calculator, geogebra.org
- Calculator: TI-84 graphing calculator
- Binder with loose leaf & graph paper; PENCILS; highlighters

Student Learning Outcomes:

- Use multiple representations of functions to interpret and describe how two quantities change together
- Measure, compute, describe, and interpret rates of change of quantities embedded in multiple representations
- Use appropriate tools and representations to investigate the patterns and relationships present in multiple function types
- Create, use, and interpret linear equations and convert between forms as appropriate
- Create, use, and interpret exponential and logarithmic equations and convert between forms as appropriate
- Create use, and interpret polynomial, power, and rational functions
- Construct, use, and describe transformations, operations, compositions, and inverses of functions
- Use algebraic techniques to simplify expressions and locate roots
- Use algebraic reasoning to simplify a variety of expressions and find roots of equations involving multiple function types
- Use rational exponents to express and simplify a variety of expressions and solve equations
- Solve and apply systems of equations and inequalities
- Demonstrate an understanding of the properties of angles and of the basic trigonometric functions
- Prove and use trigonometric identities
- Identify important properties of the graphs of trigonometric functions
- Solve equations involving trigonometric functions
- Solve for missing lengths of angles of oblique triangles
- Use and describe inverse trigonometric functions
- Understand vectors and polar coordinates

LAP's:

All students will receive access to a copy of the LAP packet at the beginning of each unit. LAP documents will be posted on Ms. Hampton's Weebly page and Google Classroom page.

LAP 1: Rational Exponents and Radical Equations (A.10) – simplifying expressions and solving radical equations

LAP 2: Functions and Graphs (Ch. 2) – properties and graphs of functions and non-functions

LAP 3: Linear and Quadratic Functions (Ch. 3) – properties and graphs of linear and quadratic functions and building models from data

LAP 4: Polynomial and Rational Functions (Ch. 4) – properties and graphs of polynomial & rational functions, solving polynomial & rational inequalities, and finding real & complex zeros of polynomial functions

LAP 5: Exponential and Logarithmic Functions (Ch. 5) – inverse functions, properties and graphing exponential/logarithmic functions and solving equations

LAP 6: Trigonometric Functions (Ch. 6) – calculating trig functions of general angles and graphs of trig functions

LAP 7: Analytic Trigonometry (Ch. 7) – inverse trig functions, solving trig equations, and trig identities & formulas

LAP 8: Applications of Trig Functions (Ch. 8) – solving right and oblique triangles

LAP 9: Polar Coordinates & Vectors (Ch. 9) – polar coordinates, vectors and the complex plane

LAP 10: Systems of Equations and Inequalities (Ch. 11) – solving linear systems, matrix algebra, partial fraction decomposition, solving non-linear systems, systems of inequalities and linear programming

LAP 11: Analytic Geometry (Ch. 10) – graphs of parabolas, circles, ellipses and hyperbolas

LAP 12: Sequences; Induction & Binomial Theorem (Ch. 12) – properties and formulas of arithmetic and geometric sequences

LAP 13: A Preview of Calculus: The Limit (Ch. 14) – finding limits using various methods, instantaneous rate of change

Tentative Schedule:

Chapter/Sections	Topic
A.10	nth Roots; Radical Equations
A.10	Rational Exponents; Factor out Common Rational Powers
	QUIZ
Sect. 1-2	Graphs of Equations in Two Variables; Intercepts; Symmetry
Sect. 2-1	Functions
Sect. 2-2	The Graph of a Function
Sect. 2-3	Properties of Functions
Sect. 2-4	Library of Functions; Piecewise-defined Functions
Sect. 2-5	Graphing Techniques: Transformations
	SUMMATIVE
Sect. 1-3	Lines
Sect. 3-1	Properties of Linear Functions and Linear Models
Sect. 3-2	Building Linear Models of Data
Sect. 3-3	Quadratic Functions and Their Properties
	QUIZ
A.6	Solving Quadratic Equations: Factoring, Completing the Square, Square Root Method, Formula
Sect. 3-4	Build Quadratic Models from Verbal Descriptions and from Data
Sect. 3-5	Inequalities Involving Quadratic Functions
	SUMMATIVE
Sect. 4-1	Polynomial Functions and Models
A.5	Rational Expressions: Operations
Sect. 4-2	Properties of Rational Functions
Sect. 4-3	The Graph of a Rational Function
	QUIZ
A.6	Solving Rational Equations
Sect. 4-4	Polynomial and Rational Inequalities
Sect. 4-5	The Real Zeros of a Polynomial Function
A.7	Complex Numbers
Sect. 4-6	Complex Zeros; Fundamental Theorem of Algebra
	SUMMATIVE
Sect. 5-1	Composite Functions
Sect. 5-2	One-to-One Functions
Sect. 5-3	Exponential Functions
Sect. 5-4	Logarithmic Functions
	QUIZ
Sect. 5-5	Properties of Logarithms
Sect. 5-6	Logarithmic and Exponential Equations
Sect. 5-7	Financial Models
Sect. 5-8	Exponential Growth and Decay Models
	SUMMATIVE

Sect. 6-1	Angles and Their Measure
Sect. 6-2	Trigonometric Functions: Unit Circle Approach
Sect. 6-3	Properties of the Trigonometric Functions
Sect. 6-4	Graphs of the Sine and Cosine Functions
Sect. 6-5	Graphs of the Tangent, Cotangent, Cosecant and Secant Functions
	SUMMATIVE
SEMESTER 1 FINAL EXAM	
Sect. 7-1	The Inverse Sine, Cosine and Tangent Functions
Sect. 7-2	The Inverse Trig Functions (Continued)
Sect. 7-3	Trigonometric Equations
Sect. 7-4	Trigonometric Identities
Sect. 7-5	Sum and Difference Formulas
Sect. 7-6	Double-angle and Half-angle Formulas
	SUMMATIVE
A.2	Geometry Essentials; Similar Triangles
Sect. 8-1	Right Triangle Trigonometry: Applications
Sect. 8-2	The Law of Sines
Sect. 8-3	The Law of Cosines
	SUMMATIVE
Sect. 9-1	Polar Coordinates
Sect. 9-2	Polar Equations and Graphs
Sect. 9-3	The Complex Plane; DeMoivre's Theorem
	QUIZ
Sect. 9-4	Vectors
Sect. 9-5	The Dot Product
	SUMMATIVE
Sect. 11-1	Systems of Linear Equations: Substitution and Elimination
Sect. 11-2	Systems of Linear Equations: Matrices
Sect. 11-3	Systems of Linear Equations: Determinants
Sect. 11-4	Matrix Algebra
	QUIZ
Sect. 11-5	Partial Fractions
Sect. 11-6	Systems of Nonlinear Equations
Sect. 11-7	Systems of Inequalities
Sect. 11-8	Linear Programming
	SUMMATIVE
Sect. 10-1	Conics
Sect. 1-4	Circles
Sect. 10-2	The Parabola
Sect. 10-3	The Ellipse
Sect. 10-4	The Hyperbola
	SUMMATIVE

Sect. 12-1	Sequences
Sect. 12-2	Arithmetic Sequences
Sect. 12-3	Geometric Sequences; Geometric Series
	SUMMATIVE
Sect. 14-1	Finding the Limits Using Tables and Graphs
Sect. 14-2	Algebra Techniques for Finding Limits
Sect. 14-3	One-sided Limits; Continuous Functions
Sect. 14-4	The Tangent Problem; Instantaneous Rate of Change
	SUMMATIVE
SEMESTER 2 FINAL EXAM	

Grading Policies:

1. Assignments should be submitted on time. It is your responsibility to communicate with Ms. Hampton if you encounter difficulty meeting this expectation.

2. If you miss a class, it is your responsibility to get the class material and homework. Materials can be found on Ms. Hampton's Google Classroom page. Ms. Hampton's Weebly page will link you to her Google Classroom Page.

3. Utilize Open Lab time to seek additional help from Ms. Hampton or any other math teacher. Please sign my open lab sheets on the large bulletin in my room when you know that you will be attending one of my open labs. This lets me know to expect you at that time. Open Lab rules are posted in my room. *Do not* come to my open lab if you do not have math related work. The reason for open labs is for students to obtain extra help in subject areas. In addition, Sr. Mary Kay is available on Wednesdays and Fridays from Mod 1 – 10. She is another wonderful resource for math help.

4. We will follow the **IWA Formative Assessment Late Work Policy**. An NLP may not be used for any quiz.

5. The grading will be based on total points. However, the following is a *general* guideline for weights:
   - Formative: Assignments/Quizzes - approximately 25% of semester grade
     - Daily Assignments (10 pts)
     - Open Lab Assignments (10 – 20 pts)
     - Quizzes (20 – 50 pts)
     - Approximately 30% of total LAP points
   - Summative: LAP Tests/Projects - approximately 60% of semester grade
     - LAP Tests are given at the end of LAP and taken in Testing Center.
     - A three to four-day window will be given to take a test in the Testing Center.
     - Projects will be slotted based upon depth and importance. They will be categorized as a test.
     - Approximately 70% of total LAP points
   - Exam: Final Exam - 15% of semester grade
     - Given at the end of each semester. It is cumulative for the current semester.
     - If receiving credit through UMSL, final exams are mandatory and a student getting an F on the final exam cannot get a higher grade than D+ on the course.

6. You can view your current grade by looking at PowerSchool. Grades will be entered within five school days of the due date of assignment/test.

7. *In order to earn credit hours through UMSL, you must earn a "C" or above*. Grades reported to UMSL will be as follows.

A+	97 - 100
A	93 - 96
A-	90 - 92
B+	87 - 89
B	83 - 86
B-	80 - 82
C+	77 - 79
C	73 - 76
C-	70 - 72
D+	67 - 69
D	65 - 66
F	64 and below

8. **Grading for UMSL**: Despite having two semesters at Incarnate Word Academy, only one grade is submitted to UMSL. 85% of the grade will consist of an average of your first semester grade before the final and your second semester grade before the final. 15% of the grade will be the average of your two final exam grades.

9. If your grade falls to a 72% or below, your parent will be contacted, and you may not be approved to attend a field trip.

10. We will follow the **IWA Retake/REDO Policy**. Please see Ms. Hampton's attached Retake/REDO Contract.

Student Expectations:

1. **Take responsibility for your own actions -** Integrity is always expected. Students are expected to uphold the following class values: courtesy, honesty, respect and a positive attitude.
2. **Arrive every day to class on time**
3. **Arrive prepared** - Students are expected to come to class with their completed assignments, pencil, paper, binder, book, calculator, BYOD and other required materials.
4. **Maintain learning atmosphere** – Students have a responsibility to themselves and to their classmates to help maintain a learning atmosphere in the classroom.
5. **Participate** - My goal is to help everyone enjoy and learn math. I will do my best to present the material in the best possible manner, from several points of view. Class participation and assignments are very critical.
6. **Prepare** – You must prepare appropriately for summatives. Relying on the REDO process to improve a score instead of adequately preparing ahead of the summative can place undue stress on yourself because you will have added extra work, extra contact time with me and Wednesday morning attendance. In addition, we will have progressed ahead in class to a further LAP.

*****I reserve the right to make changes to this syllabus*******

HAMPTON – HONORS PRECALCULUS – TRIG ACP
SYLLABUS ACKNOWLEDGEMENT
2018-2019

I have read the Honors Precalculus Trig ACP Syllabus and I understand the policies and consequences. I realize that it is my responsibility to fulfill the requirements of each LAP and to make up any missed work. I am aware of how to register through UMSL's website and am aware of the registration deadline for UMSL credit. I have shared this registration information with my parents.

_____ _____

Signature of Student **Date**

My daughter has shared this syllabus with me and I am familiar with its content. She has also shared with me the registrations deadline for UMSL credit.

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Signature of Parent or Guardian **Date**