



**Course Information**

<b>Course Title</b>	Pre-Calculus Math
<b>Course Prefix, Num. and Title</b>	MATH 2312
<b>Division</b>	Math & Physical Sciences
<b>Department</b>	Mathematics
<b>Course Type</b>	Academic WCJC Core Course
<b>Course Catalog Description</b>	In-depth combined study of algebra, trigonometry, and other topics for calculus readiness.
<b>Pre-Requisites</b>	MATH 1314 and MATH 1316; or four years of high school math including trigonometry or pre-calculus; or department head approval
<b>Co-Requisites</b>	None

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	3:3:0
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	3
<b>Lab/Other Hours Breakdown: Lab Hours</b>	0
<b>Lab/Other Hours Breakdown: Clinical Hours</b>	0
<b>Lab/Other Hours Breakdown: Practicum Hours</b>	0
<b>Other Hours Breakdown</b>	0

**Approval Signatures**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>		
<b>Department Head:</b>		
<b>Division Chair:</b>		
<b>Dean/VPI:</b>		
<b>Approved by CIR:</b>		

## Additional Course Information

**Topical Outline:** Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

### Unit 1: Algebraic Functions and Equations

- 1.1 – Linear Equations
- 1.4 – Quadratic Equations
- 1.6 – Other Types of Equations
- 1.8 – Absolute Value Equations
- 2.3 – Functions
- 2.6 – Graphs of Basic Functions
- 2.7 – Graphing Techniques
- 2.8 – Function Operations and Composition
- 3.2 – Synthetic Division
- 3.3 – Zeros of Polynomial Functions
- 3.4 – Polynomial Functions: Graphs, Applications, and Models
- 3.5 – Rational Functions: Graphs, Applications, and Models

### Unit 2: Transcendental Functions and Equations

- 4.1 – Inverse Functions
- 4.2 – Exponential Functions
- 4.3 – Logarithmic Functions
- 4.4 – Evaluating Logarithms and the Change-of-Base Theorem
- 4.5 – Exponential and Logarithmic Equations
- 4.6 – Applications and Models of Exponential Growth and Decay

### Unit 3: Trigonometric Functions and their Graphs

- 6.1 – Radian Measure
- 6.2 – The Unit Circle and Circular Functions
- 6.3 – Graphs of Sine and Cosine Functions
- 6.4 – Translation of the Graphs of Sine and Cosine Functions
- 6.5 – Graphs of Tangent and Cotangent Functions
- 6.6 – Graphs of Secant and Cosecant Functions

### Unit 4: Trigonometric Identities

- 7.1 – Fundamental Identities
- 7.2 – Verifying Trigonometric Identities
- 7.3 – Sum and Difference Identities
- 7.4 – Double-Angle and Half-Angle Identities
- 7.5 – Inverse Trigonometric Functions
- 7.6 – Trigonometric Equations

### Unit 5: Solving Triangles and Getting Ready for Calculus

- 5.4 – Solutions and Applications of Right Triangles
- 8.1 – The Law of Sines
- 8.2 – The Law of Cosines
- 11.4 – The Binomial Theorem
- R4 – Factoring Polynomials
- R6 – Rational Exponents

## Course Learning Outcomes:

### Learning Outcomes – Upon successful completion of this course, students will:

1. Demonstrate and apply knowledge of properties of functions.
2. Recognize and apply algebraic and transcendental functions and solve related equations.
3. Apply graphing techniques to algebraic and transcendental functions.
4. Compute the values of trigonometric functions for key angles in all quadrants of the unit circle measured in both degrees and radians.
5. Prove trigonometric identities.
6. Solve right and oblique triangles.

### Methods of Assessment:

Final Exam (Required)

Other Methods of Assessment:

- Hour Exams
- Homework
- Quizzes
- Short Answer
- Discussion Board
- Participation
- Projects

### Required text(s), optional text(s) and/or materials to be supplied by the student:

~~"Mathematical Applications for the Management, Life, and Social Sciences" by Harshbarger and Reynolds, Cengage, 11th edition.~~

"Precalculus" by Lial, Hornsby, Schneider, and Daniels; 6<sup>th</sup> edition; Pearson

Students must have computer access to the WCJC website, their WCJC student email and online accounts. WCJC has open computer labs, with internet access, on all campuses for students to use.

### Suggested Course Maximum:

35

### List any specific or physical requirements beyond a typical classroom required to teach the course.

None

**Course Requirements/Grading System:** Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

- A. Final Exam 15-30%  
B. Other Course Requirements 70-85%

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = 59 or below

Version: 3/20/2019

## Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
  - Critical Thinking
  - Communication
  - Empirical & Quantitative Skills
  - Teamwork
  - Social Responsibility
  - Personal Responsibility
- WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist

**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2312 – Pre-Calculus Math

**Core Objective:**

**Critical Thinking Skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Recognize and apply algebraic and transcendental functions and solve related equations. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written answer. Grading for correctness and the rubric for critical thinking will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
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Date: 11/20/2019

**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2312 – Pre-Calculus Math

**Core Objective:**

**Communication Skills**—to include effective development, interpretation and expression of ideas through written, oral and visual communication

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Recognize and apply algebraic and transcendental functions and solve related equations. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student's written answer. Grading for correctness and the rubric for communication skills will assess this.
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	Provide a brief name and description of the sample learning activity.	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective.
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Date: 11/20/2019



**Foundational Component Area:** Core 020: Mathematics

**Course Prefix & Suffix:** MATH 2312 – Pre-Calculus Math

**Core Objective:**

**Empirical and Quantitative Skills**—to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

**Student Learning Outcome Supporting Core Objective:**

For each core objective, there must be at least two different methods of assessment.

<b>SLO Status</b>	<b>Student Learning Outcome (SLO)</b>	<b>Learning Activity</b>	<b>Assessment</b>
State Mandated	Recognize and apply algebraic and transcendental functions and solve related equations. (SLO #2)	A word problem (application) where the student must identify variables, assemble the correct formulas and solve for the desired result. A brief paragraph will be included explaining what was done.	A quiz, test, or discussion board artifact showing the student’s written answer. Grading for correctness and the rubric for EQS will assess this.
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