

UW Oshkosh CAPP Math 108
Pre-Calculus (5 credits)
Fall Semester 2021 (UW Oshkosh)
Trimester 1 8:50-10:05 & 12:10-1:20
Mr. Kraft, West De Pere High School
pkraft@wdpsd.com, Room K205



Required Texts:

CPM Calculus Third Edition

UWO Course Description:

A functional approach to college algebra and trigonometry. Polynomial, exponential, logarithmic, circular and trigonometric functions.

Recommended for all students who place at this level and who expect to take the Mathematics 171 – Mathematics 172 calculus sequence. May not receive credit for both Mathematics 104 and 108. Prerequisite: Mathematics 103 with a grade of C or better or placement.

Completion of this course fulfills an Explore requirement for the USP program at UWO.

UWO course objectives/goals:

This course provides an introduction or review to precalculus. It presents Equations and Inequalities, Functions and Relations, Polynomials and Rational Functions, and Exponential and Logarithmic Functions, Trigonometric Functions, Trigonometric Identities, and Applications of Trigonometric Functions.

Learning Outcomes:

The goal of this course is to give students appreciation of mathematics and algebraic tools they need in order to be successful in other mathematics and science courses. It focuses on problem solving, critical thinking and learning basic concepts in pre-calculus.

Upon successful completion of the course, students are expected, but are not limited, to have the ability to do the following:

- Be able to communicate graphically, numerically, and algebraically in the notation and vocabulary of pre-calculus.
- Display a basic understanding of the general concepts of functions, relations, equations, and inequalities.
- Be competent in working with linear and quadratic functions in theory and application.
- Be able to show a basic understanding of inverse functions by displaying by showing a proficiency in working with their properties.
- Be able to identify the properties of polynomials of different degrees and rational functions.

- Have an understanding of how the roots of a polynomial determine its factorization.
- Display a working knowledge of the definitions and manipulations of exponential and logarithmic functions and equations.
- Display a working knowledge of sine, cosine, and tangent using right triangle geometry as well as on the unit circle.
- Be able to use the graphs to the periodic behavior of the trigonometric functions.
- Have a basic understanding of how identities show equivalence, and know how to prove elementary identities using more basic properties of trigonometric functions.
- Gain exposure to more sophisticated famous identities such as the half and double-angle formulas and product-sum and sum-product identities.
- Be able to model and predict situations using pre-calculus.

Course content and program:

Chapter	Topic Outline	Expected Timeline (days)
1	Algebra Review Topics <ul style="list-style-type: none"> ● Functions ● Interpreting Graphs ● Rates of Change ● Piecewise Functions ● Radians ● Composite and Inverse Functions 	14
2	Trigonometric Functions <ul style="list-style-type: none"> ● Unit Circle ● Sine and Cosine Graphs ● Solving Trigonometric Equations 	13
3	Polynomial Functions <ul style="list-style-type: none"> ● Rewriting Expressions ● Graphing Polynomial Functions ● Area under the curve ● Sigma Notation ● Application Problems 	13
4	Rational Functions <ul style="list-style-type: none"> ● Graphing Rational Functions ● Polynomial and Rational Inequalities ● Simplifying Rational Functions 	10
5	Logarithms and Exponential Functions <ul style="list-style-type: none"> ● Applications of Logs and Exponents ● Properties of Logarithms ● The number e 	
6	Law of Sines, Cosines and Vectors	12

	<ul style="list-style-type: none"> ● Applications LoS and LoC ● Vector Operations ● Vector Applications ● Dot Product 	
7	Limits and Rates of Change <ul style="list-style-type: none"> ● Introduction to Limits ● Average Rates of Change ● Instantaneous rates of change 	13
8	Trigonometric Identities <ul style="list-style-type: none"> ● Proving Trig Identities ● Angle Sum and Difference Identities ● Double and Half Angle Identities ● Solving Complex Trig Equations 	13
13	Introduction to Calculus <ul style="list-style-type: none"> ● Limits to Infinity ● Area under the curve ● Introduction to Derivatives ● Velocity and Position 	15

The University Studies Program (USP):

The University Studies Program (USP) provides students with an assessable, common intellectual experience that also embraces the traditional breadth of a liberal arts education. Math 108 is part of the USP, in the Nature category of the Explore component of the program. The ability to analyze, break down and solve a mathematical problem and then to apply the knowledge and skills thus gained is an essential part of what the USP and in turn a Liberal Arts Education aim to achieve.

USP Explore Nature Essential Learning Outcomes:

1. Skills, both Intellectual and Practical: *Identification and objective evaluation of theories and assumptions.*
2. Skills, both Intellectual and Practical: *Critical and creative thinking.*

Methods of Evaluation:

Unit Tests: 60%

Quizzes: 30%

Homework/Classwork: 10%

Your UWO grade will be an average of your two trimesters at West De Pere High School.

UWO Grading Scale:

A	93-100%	C	73-76%
A-	90-92%	C-	70-72%
B+	87-89%	D+	67-69%
B	83-86%	D	63-66%
B-	80-82%	D-	60-62%
C+	77-79%	F	Below 60%

UWO course policies:

Please see the instructor about any anticipated absences. Late work will be accepted with prior approval from the instructor, and any missed exams will need to be rescheduled with the instructor.

Academic integrity policy. See the following link for UWO's statement on academic integrity and policies regarding academic misconduct:

<https://uwosh.edu/deanofstudents/student-conduct/academic-misconduct/>

Consumer information policy. Students are advised to see the following URL for disclosures about essential consumer protection items required by the Students Right to Know Act of 1990:

<https://uwosh.edu/financialaid/resources/consumer-information/>

CAPP students and families, please note:

All CAPP students, through their UW Oshkosh student ID number, email, Net ID, and Titan Card have access to UW Oshkosh on-campus and online events and resources, just as regular UWO students do. These include the Polk Library database and research resources, on-campus clubs, events, and contests as well as **CAPP scholarships**.

If a CAPP student plans to enroll at UW Oshkosh as an incoming freshman, he/she may apply for a **CAPP Scholarship of \$500** or, if eligible, a **CAPP Honors College Scholarship of \$1000**.

For more information on the CAPP Scholarships visit

<http://www.uwosh.edu/capp/students/capp-student-scholarship>

If you or your parents would like further information about studies in mathematics at UW Oshkosh, please contact your CAPP Course mathematics liaison, Amy Parrott at parrotta@uwosh.edu.

At UW Oshkosh, the foundation to your learning is a liberal arts education. Liberal Education is an approach to learning that empowers individuals and prepares them to deal with complexity, diversity, and change. It provides students with broad knowledge of the wider world (e.g. science, culture, and society) as well as in-depth study in a specific area of interest. A liberal education helps students develop a sense of social responsibility, as well as strong and transferable intellectual and practical skills such as communication, analytical and problem solving skills, and a demonstrated ability to apply knowledge and skills in real world settings.