

# Syllabus for Precalculus ALGEBRA, MATH 118

Fall 2020 at UWSP at Wausau, 9:00-9:50 Mon., Tue., Thur., Fri. in CCE Building On Stage

## Instructor

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**Office Hours** MWF 10:00 –10:50 on M, T, Th, F.

<https://us.bbcollab.com/guest/6cd47aa37404410fb913f5c2bea3ab2c>

In this blackboard collaborate room, we can share video and applications and a shared whiteboard. I will be available in the room at 10:00 –10:50 on M, T, Th, F. I am also happy pop into the virtual room at other times; Just send me an email or leave a phone message requesting a meeting. The room can also be used by my students for student-to-student meetings,

**Text:** Algebra and Trigonometry 4<sup>th</sup> ed. By Stewart, Redlin, and Watson. ISBN 978-1-305-07174-2

## Course Catalog Description:

Topics include concepts, graphs, and properties of functions, inverse and algebraic functions, techniques of graphing, conic sections, linear and nonlinear systems, arithmetic and geometric series, mathematical induction and the binomial theorem.

In this course we will study the function concept. In so doing we hope to:

- Refresh and hone algebraic manipulative skills.
- Develop function concepts in terms of graphs, tables, and formulas for polynomial, exponential, logarithmic, and rational functions.
- Identify transformations of basic function types from their graphs and their formulas.
- Develop the concept and properties of inverse function relations.
- Study polynomial functions, their zeros, and factorization.
- Study rational functions and their graphs and the relationship between their graphs and the zeros of the denominator and numerator polynomials.
- Solve polynomial, logarithmic, exponential and radical equations as well as systems of equations using Gaussian Elimination and also Augmented Matrices and Reduced Row-Echelon Form.
- Study arithmetic and geometric (Linear and Exponential) sequences and series.
- Develop the method of proof by mathematical induction.

A detailed schedule of topic coverage is provided on the back of the syllabus.

**Homework:** For each topic we cover, I will hand out a skeleton of the notes for the day which will include a list of problems from the text to work out. You should attempt all of these and others as necessary to achieve understanding of concepts and techniques. You should be spending about ~2 hours studying the material and working problems after each class meeting. Any problems or concepts that you don't understand should be brought up at the start of the class for discussion and resolution. During each non-exam week, I will provide you a handout with the problems from that week that I will collect on Friday. The hand-in collected problems will mostly be very similar to some of those assigned from the textbook. These will account for 100 points towards the course total of 550 points.

**Exams:** There will be an in-class test about once every four weeks or so according to the schedule opposite. The tests will be on material covered since the previous exam. About 30-40% of these exams will be take-home and assigned about a week before the in-class component. You are encouraged to use the textbook and to consult as needed on the take-home parts of these exams, but must hand in your own write-up of the problems. There will also be a comprehensive final exam on **Dec. 17 from 2:45 -4:45pm from Canvas.**

<b>Grades:</b> The three hour-exams will count for a total of 300 points. In addition to the in-class tests there will be a Final Exam worth 150 points. The cut-off scores for A,B,C,D,F-grades will be very close to 90, 80, 70, and 60%.	Homework	100
	In-class Tests	300
	Final Exam	150
	Total	550

The final exam score will normally count as 150 points out of 550. However, if the % score on the final is higher than either the homework total or of any single hour exam, the final exam % will replace the lowest 100 point input to the course grade. Homework/exams missed for less than adequate reason will count as zero.

#### Tentative Schedule for the Semester

Week	Sections	Content
Sept 2	P.3-P.5	Exponent Rules, Radicals, Polynomials,
Sept 7	P.6-P.8	Factoring algebraic expressions, Working with Rational Expressions and Solving basic Equations.
Sept 14	1.2, 1.3 2.1, 2.2	Equations of Circles and Lines, e.g. $y = mx + b$ , $y = y_1 + m(x - x_1)$ , $(x - h)^2 + (y - k)^2 = R^2$ Functions and graphs of functions.
Sept 21	2.3-2.5	Reading information and describing a function in terms of its graph. Average rate of change of a function and linear functions and modeling with linear functions.
Sept 28	2.6	Transformations (shifts and stretches and reflections) of functions. <b>Exam I</b>
Oct 5	2.7-2.8	Combining functions through arithmetic and composition and finding formulas for going in the reverse direction of a function (Finding <b>Inverse Function Formulas</b> ).
Oct 12	3.1-3.3	Quadratic and polynomial functions and their graphs. Especially end-behavior and relation between factored form and shape of graphs near $x$ -intercepts.
Oct 19	<b>3.4, 3.5</b>	Finding real and complex zeros and factorization of polynomials. Fundamental Theorem of Algebra. (Factor Theorem!)
Oct 26	3.6-3.7	Rational functions and nonlinear inequalities and the relation between their formulas and graphs and solutions. <b>Exam II</b>
Nov 2	4.1-4.3	Exponential and Logarithmic Functions including $e^x$ and $\ln x$ .
Nov 9	4.4-4.6	Properties of Logarithms and solving exponential and logarithmic equations. Exponential growth and decay models.
Nov 16	10.3 11.1, 11.3	Partial Fractions to decompose Rational functions. Augmented Matrices and Reduced Row Echelon Form, Determinants and Kramer's Rule
Nov 23	12.1	Thanksgiving Break is on Nov 26 & 27 (no classes) <b>Exam III.</b> Review parabolas and find foci.
Nov. 30	12.2-12.3	Ellipses and Hyperbolas and shifted Conic Sections.
Dec. 7	13.1-13.3, 13.5	Sequences and Series especially Arithmetic (linear) and Geometric (exponential) types, and proof by induction.
		<b>Final exam is on Dec. 17 from 2:45 -4:45 Online through Canvas.</b>