## MATHEMATICS (MATH)

For up-to-date information on when online courses from the Distance Learning Campus are typically offered, see https://www.uwplatt.edu/ department/professional-program-support/course-offerings (https://www.uwplatt.edu/department/professional-program-support/course-offerings/).

## MATH 10 Elementary Algebra 3 Credits

Intended for students with little or no previous algebra. Topics include the real number system, operations with real numbers and algebraic expressions, linear equations and inequalities, polynomials, factoring, and introduction to quadratic equations. (This course is required for students with a mathematics proficiency level of 5 . This course does not carry UWP degree credit.)
Components: Class
Prereqs/Coreqs: P. MATH 5 or math placement level of 5

## MATH 1120 Supplemental Skills for Calculus 2 Credits

This is an eight-week course designed to provide students with additional tools and experience to successfully complete Calculus I. Students can withdraw from Calculus I mid-semester and enroll in Math 1120 as an opportunity for a productive second half of the semester or as a standalone course (based on availability.) This course includes a review of some fundamental topics from algebra and trigonometry, as well as the development of study skills and the mindset required for success in Calculus I and beyond.
Components: Class
Prereqs/Coreqs: P. MATH 2450 or MATH 2530 with a grade of 'C-' or better, mathematics proficiency level of 40 , or permission from the Mathematics Department

## MATH 12 Mathematical Problem Solving 3 Credits

Mathematical modeling and basic algebra, including fractions and decimals, algebraic expressions and functions, and systems of linear equations and inequalities. Problem solving methods and strategies will be emphasized, as well as success skills such as study skills, time management, and notetaking. (This course does not carry UWP degree credit.)
Components: Class

## MATH 15 Intermediate Algebra 3 Credits

Fundamental operations, factoring, fractions, equations, functions, graphing, exponents and radicals, linear equations, systems of equations, inequalities, polynomials, rational expressions, and quadratics. (This course does not carry UWP degree credit.)
Components: Class
Prereqs/Coreqs: P. MATH 10 or MATH 12 with a "C-" or better or mathematics proficiency level of 10 or above

## MATH 1530 College Algebra 3 Credits

Equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, complex numbers, systems of equations. This course is equivalent to the first half of Math 2450 . Students will not receive credit for both Math 1530 and Math 2450 .

## Components: Class

Prereqs/Coreqs: P. MATH 15 with a grade of "C-" or better or mathematics proficiency level of 15 or above. (MATH 1530 and MATH 2530 may not be taken concurrently)

## MATH 1620 Quantitative Reasoning 3 Credits

This course is intended to develop analytic reasoning and the ability to solve quantitative problems. Topics to be covered include construction and interpretation of graphs, functional relationships, descriptive statistics, geometry and spatial visualization, math of finance, exponential growth, and basic probability. Appropriate use of units and dimensions, estimates, mathematical notation and available technology will be emphasized throughout the course.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 10 or 12 with a grade of C - or better, or mathematics proficiency level of 10 or above

## MATH 1720 Mathematical Explorations 3 Credits

A course to enrich the students' general education by presenting the spirit and some insights of mathematics. The course satisfies the Mathematics Competency requirement, but will not serve as a prerequisite for further math courses. Topics will illustrate the nature of contemporary mathematics and the relationship between mathematics and our cultural heritage. Some of the content and format of the course may vary depending on the instructor's interests. All instructors of the course will include a common unit on mathematical reasoning and problem solving. Other content and format of the course may vary depending on the instructor's interests.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

## MATH 1730 Mathematics of Finance 3 Credits

Simple and compound interest, annuities, amortization, depreciation, valuation of securities, and bonds.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

## MATH 1830 Elementary Statistics 3 Credits

An introduction to statistical analytical methods including graphing distributions, numerical summaries, linear regression and correlation, the normal distribution, confidence intervals and hypothesis tests for means and proportions, analyzing two-way tables, and analysis of variance. Minitab will be used throughout the course.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

## MATH 1920 Finite Mathematics with Applications 3 Credits

Coordinate systems and graphs, matrices, linear systems, linear programming (geometric approach), set theory, counting techniques, probability, Markov chains.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 15 with a C- or better or mathematics proficiency level of 15 or above

MATH 2130 Discrete Structures 3 Credits
Sets, matrices, logic, permutations, combinations, relations, functions, trees, graph theory, and discrete probability.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 1530 or 2450 or higher with a grade of "C-" or better or a mathematics proficiency level of 30 or above
MATH 2450 Precalculus 5 Credits
Solving equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions, trigonometric identities and formulas, complex numbers, and conic sections. This course is equivalent to taking both Math 1530 and Math 2530 . Students who have credit for Math 1530 or Math 2530 should not take Math 2450.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 15 with a grade of "B-" or better or mathematics proficiency level of 20 or above

## MATH 2530 Trigonometry and Analytic Geometry 3 Credits

Functions and their graphs, trigonometric and inverse trigonometric functions, trigonometric identities and formulas, solution of triangles, complex numbers, exponential and logarithmic functions, and conic sections. This course is equivalent to the second half of Math 2450 . Students will not receive credit for both Math 2450 and Math 2530
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 1530 with a grade of "C-" or better or mathematics proficiency level of 30 or above

## MATH 2610 Introductory Mathematics Seminar 1 Credit

This course serves as an introduction to various areas of mathematics. It provides majors in the Mathematics Department with information about undergraduate research and career options as well as about departmental, College, and University resources and requirements. The course helps students plan how to make the most of their time at University of Wisconsin-Platteville, and establish a foundation for academic and co-curricular success.
Components: Class
Prereqs/Coreqs: P. MATH 2450 or MATH 2530 with a grade of 'C-' or better, or mathematics proficiency level of 40

## MATH 2630 Business Calculus 3 Credits

Functions, limits, rates of change, exponential and logarithmic functions, differentiation, integration; with applications in the fields of business and economics.

Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 1530 or MATH 2450 with a grade of "C-" or better, or mathematics proficiency level of 30 or above

## MATH 2640 Calculus and Analytic Geometry I 4 Credits

Limits and continuity, differentiation, differentials, antiderivatives, the definite integral and applications.
Components: Class
GE: Math competency
Prereqs/Coreqs: P. MATH 2450 or MATH 2530 with a grade of "C-" or better, or mathematics proficiency level of 40

## MATH 2730 Discrete Mathematics 3 Credits

Logic, sets, combinations, relations, graphs, and discrete probability.
Components: Class
Prereqs/Coreqs: P. MATH 2640 with a grade of "C-" or better

## MATH 2740 Calculus and Analytic Geometry II 4 Credits

Derivatives and integrals involving exponential, logarithmic, and inverse trigonometric functions, further study of limits, further techniques and applications of integration, sequences and series, polar coordinates, and parametric equations.
Components: Class
Prereqs/Coreqs: P. MATH 2640 with a grade of "C-" or better or advanced placement

## MATH 2840 Calculus and Analytic Geometry III 4 Credits

Analytic geometry of three dimensions, vector analysis, partial differentiation, multiple integrals, and line integrals.
Components: Class
Prereqs/Coreqs: P. MATH 2740 with a grade of "C-" or better or advanced placement

## MATH 2910 Calculus and Analytic Geometry III Extension 1 Credit

Math 2910 is a 1 -credit supplement to Math 2840 Calculus and Analytic Geometry III. The course covers analytic geometry of three dimensions, surfaces and surface integrals, Stokes' Theorem, and the Divergence Theorem.
Components: Class
Prereqs/Coreqs: P. MATH 2840 with a grade of "C-" or better
MATH 3020 Teaching of Mathematics in the Middle and Secondary School 3 Credits
An analysis of the mathematics studied in the middle and secondary schools. Topics include the principles and standards implemented by the NCTM for teaching mathematics and the methods and materials used in educating students in mathematics.
Components: Class
Prereqs/Coreqs: P. MATH 2640 and MATH 2740 with a "B-" or better and junior standing and admission to the School of Education
MATH $\mathbf{3 0 4 0}$ Mathematics Seminar for Middle School Teachers 4 Credits
This course is intended to provide a background for teaching algebra and geometry in the middle school. This course will emphasize problem solving, communication, reasoning, representations, and making connections. Through problem-solving activities lead by either the instructor or students, the course will emphasize specific topics such as proportional reasoning, pattern finding, generalizing functional relationships, solving equations, area, perimeter, and volume. In particular, the course will emphasize the links between algebra and geometry, and when appropriate, will use relevant manipulatives including technology. The course will also emphasize pedagogical implications of current research regarding the teaching and learning of algebra and geometry.
Components: Class
Prereqs/Coreqs: P. Junior standing and admission to the School of Education and math proficiency level of 40 (or C- or better in MATH 2450,
MATH 2530, or MATH 2640)

## MATH 3230 Linear Algebra 3 Credits

Matrices, systems of equations, determinants, eigenvalues, eigenvectors, vector spaces, linear transformations, and diagonalization. This class is intended to introduce students to formal mathematics. Students will be expected to write definitions, theorems, and proofs. Credit may be earned for only one of MATH 3230 or ENGRG 5030.

## Components: Class

Prereqs/Coreqs: P. MATH 2740 with a grade of "C-" or better. Credit may be earned for only one of MATH 3230 or ENGRG 5030

## MATH 3630 Differential Equations I 3 Credits

Solutions of first order differential equations, linear homogeneous and nonhomogeneous differential equations, Laplace transforms, linear systems and applications.
Components: Class
Prereqs/Coreqs: P. MATH 2840 with a grade of "C-" or better

## MATH 3730 Numerical Analysis 3 Credits

This course is intended to provide an introduction to numerical methods. Topics will include computer arithmetic, solving nonlinear equations, numerical linear algebra, interpolation and curve fitting, and numerical differentiation and numerical integration.
Components: Class
Prereqs/Coreqs: P. MATH 3230 with a "C-" or better and COMPUTER 1430 with a "C-" or better

## MATH 3830 Differential Equations II 3 Credits

Linear systems of differential equations, nonlinear systems, series solutions of differential equations, partial differential equations, orthogonal sets, and Fourier series.
Components: Class
Prereqs/Coreqs: P. MATH 3630 with a grade of "C-" or better

## MATH 4030 Statistical Methods with Applications 3 Credits

Introduction to probability, density and distribution functions, special discrete and continuous distributions, estimation, hypothesis testing, chi-square, correlation and regression.
Components: Class
Prereqs/Coreqs: P. MATH 2740 with a grade of "C-" or better

## MATH 4050 Applied Regression Analysis 3 Credits

A thorough investigation of regression methods used in statistics including linear regression models, multiple regression models, model building, residual analysis, and time series. Students in this course will also learn about the underlying mathematical models for the analyses. Students may not receive credit for both STAT 3130 and MATH 4050.
Components: Class
Prereqs/Coreqs: P. MATH 4030 with a grade of "C-" or better

## MATH 4130 Mathematical Statistics 3 Credits

Continuation of probability, density and distribution functions, special discrete and continuous distributions, estimation, multivariate distributions, moments and moment generating functions, transformations of random variables, order statistics, joint and conditional distribution functions, introduction to insurance and risk management terms in connection with probability.See the Society of Actuaries' Exam P syllabus online.
Components: Class
Prereqs/Coreqs: P. MATH 4030 with a grade of 'C-' or better and MATH 2840 with a 'C-' or better

## MATH 4210 College Geometry 3 Credits

Topics from Euclidean geometry including classical theorems, transformational geometry, and Euclidean constructions. Non-Euclidean topics include inversion and reciprocation, as well as some ideas from projective geometry. A dynamic geometry software program is used extensively to illustrate ideas in this course
Components: Class
Prereqs/Coreqs: P. Math 2730 with a "C-" or better

## MATH 4310 Abstract Algebra 3 Credits

Study of the structure of abstract algebraic systems through formal proof. Deals primarily with groups, but also examines other algebraic systems including rings and fields.
Components: Class
Prereqs/Coreqs: P. Math 3230 with a grade of C - or higher and either Math 2730 with a grade of C - or higher or consent of instructor

## MATH 4320 History and Development of Mathematical Concepts 3 Credits

A study of the history and development of mathematics from the primitive origins of numbers to modern mathematics.
Components: Class
Prereqs/Coreqs: P. MATH 2840 with a grade of "C-" or better

## MATH 4330 Theory of Numbers 3 Credits

Integers, divisibility, prime numbers, Euclidean algorithm, linear Diophantine equations, congruences, Wilson's and Euler's theorems, Fermat's little theorem, and other selected topics.
Components: Class
Prereqs/Coreqs: P. MATH 2730 or MATH 4310 with a grade of "C-" or better

MATH 4430 Real Analysis 3 Credits
Study, through formal proof, of sets, functions, the real numbers, sequences, limits, continuity, differentiation, and integration.
Components: Class
Prereqs/Coreqs: P. Math 2840 with a grade of C- or higher and either Math 2730 with a grade of C- or higher or consent of instructor

## MATH 4530 Complex Variables 3 Credits

Complex numbers, complex functions, differentiation, elementary functions, integration, and infinite series.
Components: Class
Prereqs/Coreqs: P. MATH 2840 with a grade of "C-" or better
MATH 4620 Topics in Modern Mathematics 1-3 Credits
Topics to be selected by the instructor.
Components: Class
Prereqs/Coreqs: P. MATH 2840 with a grade of "C-" or better
MATH 4660 Cooperative Field Experience 1-8 Credits
Enhancement of the educational experience through placement of a student with a cooperating agency, business, industry or institution. The nature of the assignment, type of experience, number of credits, and evaluation procedure to be stipulated in a statement of agreement (learning contract) between the student and department.
Components: Field Studies

## MATH 4710 Undergraduate Research 1-3 Credits

Students will work with a supporting faculty member on a research project. A maximum of 3 credits may be applied towards the Mathematics Major electives requirement.
Components: Research
Prereqs/Coreqs: P. Math 2740 with a grade of "C-" or better

## MATH 4810 Senior Seminar 1 Credit

Development of library research techniques, organization and presentation of research findings beyond those formed in existing courses.
Components: Seminar
Prereqs/Coreqs: P. 12 credits of mathematics selected from MATH 3100 and above, including either MATH 4430 or MATH 4310 (formerly 3330) with a grade of "C-" or better

MATH 4920 Independent Study in Mathematics 1-3 Credits
Components: Independent Study

