

# MATHEMATICS (MATH)

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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 note-taking. (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 2650 Calculus I 5 Credits**

Analytic geometry, functions, limits and continuity, the derivative, integrals, techniques and applications of differentiation, applications of integration, logarithmic and exponential functions, and trigonometric functions.

**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 2750 Calculus II 5 Credits**

Techniques of integration, polar coordinates, conic sections, infinite series, and vectors of two and three dimensions.

**Components:** Class

**Prereqs/Coreqs:** P. A grade of C- or better in MATH 2650, or placement based on the AP exam

**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 3040 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.

**Components:** Class

**Prereqs/Coreqs:** P. MATH 2740 with a grade of "C-" or better

**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 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