MATHEMATICAL SCIENCES (MATH)

Mathematical Sciences Courses

MATH 75 Math Success Strategies
0 cr. Undergraduate.
Highly interactive format providing mathematics instruction and instilling study skills and strategies for succeeding in mathematics courses.
Prerequisites: none.
Course Rules: Fee for variable credit assessed (1-6) depending on contact hours; credits count toward credit load for Financial Aid and enrollment verification only. Satisfactory/Unsatisfactory only.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 90 Basic Mathematics
0 cr. Undergraduate.
Arithmetic operations involving whole numbers, integers, positive and negative rational numbers; decimals, percents; ratio, proportion; radicals; descriptive statistics; units of measure; geometry; introduction to algebra.
Prerequisites: none.
Course Rules: Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only. Not open to students eligible for math courses that carry graduation credit.
Last Taught: Summer 2019, Summer 2018, Summer 2017, Summer 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 92 Mathematical Literacy for College Students I
0 cr. Undergraduate.
Introduction to numeracy, proportional reasoning, algebraic reasoning, and functions. Emphasis on developing conceptual and procedural tools that support the use of key mathematical concepts in context.
Prerequisites: none.
Course Rules: Fee for 3 cr assessed; counts as 3 cr toward cr load for Financial Aid & enrollment verification. Not recommended for students planning to take Calculus or Chem 100.
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 94 Foundations of Elementary Mathematics
0 cr. Undergraduate.
Arithmetic, geometry, and beginning algebra; develops mathematical reasoning, problem solving, and facility with basic mathematical objects and their relationships. Individualized instruction via adaptive learning software.
Prerequisites: none.
Course Rules: Fee for 6 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only. Math 94 counts as repeat of Math 90 & 95.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 95 Essentials of Algebra
0 cr. Undergraduate.
Number systems; linear equations, inequalities; exponent notation, radicals; polynomials, operations, factoring, rational expressions; coordinate geometry; linear systems; quadratic equations.
Prerequisites: a grade of C or better in MATH 90(P) or MATH 102(P); or grade of D in MATH 94(P); or Math Placement Level 10.
Course Rules: Fee for 3 cr assessed; credits count toward credit load for Financial Aid and enrollment verification only.
Last Taught: Spring 2023, Fall 2022, Spring 2022, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 98 Algebraic Literacy I
0 cr. Undergraduate.
Arithmetic number systems; linear equations, inequalities; exponent notation, radicals; polynomials, operations, factoring; modeling; coordinate geometry; linear systems; quadratic equations.
Prerequisites: a grade of C or better in MATH 90(P), MATH 92(P), or MATH 102(P); or grade of D in MATH 94(P); or Math Placement Level 10.
Course Rules: Fee for 3 cr assessed; counts as 3 cr toward credit load for Fin Aid & enrollment verification only.
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 100 Supplemental Math
1-2 cr. Undergraduate.
Development of foundational skills and concepts to allow concurrent enrollment in certain credit-bearing mathematics courses in place of prerequisite enrollment.
Prerequisites: department consent.
Course Rules: Retakeable to 2 cr max. Specific topic and additional prerequisites announced in schedule of classes each time course is offered.
General Education Requirements: QLA
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 102 Mathematical Literacy for College Students II
3 cr. Undergraduate.
Continuation of MATH 92, with an integrated approach to numeracy, proportional reasoning, algebraic reasoning, and functions.
Prerequisites: a grade of C or better in MATH 92(P) or MATH 90(P); or grade of D in MATH 94(P); or Math Placement Level 10.
General Education Requirements: QLA, MTH
Last Taught: Summer 2025, Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 102X Mathematical Literacy for College Students II
3 cr. Undergraduate.
Continuation of MATH 92, with an integrated approach to numeracy, proportional reasoning, algebraic reasoning, and functions.
Prerequisites: a grade of C or better in MATH 92(P) or MATH 90(P); or grade of D in MATH 94(P); or Math Placement Level 10.
General Education Requirements: QLA, MTH
Last Taught: Summer 2025, Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 103 Contemporary Applications of Mathematics
3 cr. Undergraduate.
Selected topics in applied mathematics and statistics, such as, but not limited to, voting theory, fair division, apportionment, graph theory, financial mathematics, and statistical inference.
Prerequisites: a grade of C or better in MATH 90(P), MATH 92(P), or MATH 102(P); or grade of D in MATH 94(P); or Math Placement Level 10.
Course Rules: Not recommended for students planning to take Calculus or CHEM 100.
General Education Requirements: QLA, MTH
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 105 Introduction to College Algebra
3 cr. Undergraduate.
Algebraic techniques with polynomials, rational expressions, equations and inequalities, exponential and logarithmic functions, rational exponents, systems of linear equations.
Prerequisites: a grade of C or better in MATH 94(P), MATH 95(P), or MATH 98(P); or Math Placement Level 20.
Course Rules: Counts as repeat of MATH 108.
General Education Requirements: MTH, QLA
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 108 Algebraic Literacy II
3 cr. Undergraduate.
Continuation of MATH 98 in polynomials, equations, and inequalities; exponential, logarithmic, and periodic functions; rational expressions and exponents; and systems of linear equations.
Prerequisites: C or better MATH 98.
Course Rules: Counts as repeat of MATH 105.
General Education Requirements: QLA, MTH
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 111 Introduction to Logic - Critical Reasoning
3 cr. Undergraduate.
Students learn a broad variety of fundamental logical methods - techniques used to identify, analyze, model, evaluate, and criticize different types of real-world reasoning.
Prerequisites: a grade of C or better in MATH 90(P), MATH 92(P), or MATH 102(P); or grade of D in MATH 94(P); or Math Placement Level 10.
Course Rules: PHILOS 111 and MATH 111 are jointly offered; they count as repeats of one another.
General Education Requirements: HU, QLA
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 115 Precalculus
4 cr. Undergraduate.
Essential topics from college algebra and trigonometry for students intending to enroll in calculus.
Prerequisites: a grade of C or better in MATH 105(P), MATH 108(P), or MATH 116(P); or Math Placement Level 30.
Course Rules: Repeats 2 cr of MATH 116 & 2 cr of MATH 117.
General Education Requirements: QLA
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 116 College Algebra
3 cr. Undergraduate.
Function concepts. Polynomial, rational, exponential, and logarithmic functions. Systems of equations and inequalities. Matrices and determinants. Sequences and series. Analytic geometry and conic sections. Induction.
Prerequisites: a grade of C or better in MATH 94(P), MATH 95(P), or MATH 98; or Math Placement Level 20.
Course Rules: 2 cr may be used to repeat 2 cr of MATH 115.
General Education Requirements: QLA, MTH
Last Taught: Spring 2025, Spring 2024, Summer 2020, Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 117 Trigonometry
2 cr. Undergraduate.
Trigonometric functions; graphs, identities, equations, inequalities; inverse trigonometric functions; solutions of triangles with applications; complex numbers; polar coordinates.
Prerequisites: a grade of C or better in MATH 105(P), MATH 108(P), or MATH 116(P); or Math Placement Level 30.
Course Rules: Counts as a repeat of 2 cr of MATH 115.
General Education Requirements: QLA
Last Taught: Summer 2020, Spring 2020, UWinteriM 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 175 Mathematical Explorations for Elementary Teachers I
3 cr. Undergraduate.
Theory of arithmetic of whole numbers, fractions, and decimals. Introduction to algebra, estimation and problem-solving strategies.
Prerequisites: Registration in elementary, early childhood, or exceptional education curriculum; and either a grade of C or better in MATH 94(P), MATH 95(P), MATH 98(P), MATH 102(P) or MATH 103(P); or Math Placement Level of at least 20.
General Education Requirements: QLA, MTH
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 176 Mathematical Explorations for Elementary Teachers II
3 cr. Undergraduate.
A continuation of MATH 175 in geometry, statistics, and probability.
Prerequisites: grade of C or better in MATH 175(P).
General Education Requirements: QLB
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 194 First-Year Seminar:
3 cr. Undergraduate.
Specific topics are announced in the Schedule of Classes each time the class is offered.
Prerequisites: none.
Course Rules: Open only to freshmen. Students may earn cr in just one L&S First-Year Sem (course numbers 192, 193, 194).
General Education Requirements: NS
Last Taught: Fall 2002, Fall 2001, Fall 2000, Spring 1999.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 199 Independent Study
1-3 cr. Undergraduate.
Regularly offered courses may not be taken as Independent Study.
Prerequisites: 2.0 GPA in all previous math courses; consent of instructor, department chair and Assistant Dean for Student Academic Services.
Course Rules: May be retaken with change in topic to 9 cr max.
Last Taught: Spring 2016, UWinteriM 2014, Spring 2011, Summer 2010.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 205 Introductory Finite Mathematics
3 cr. Undergraduate.
Elementary deterministic and probabilistic discrete mathematics and applications to a wide variety of disciplines. Topics may include linear programming, Markov chains, optimization, stochastic processes.
Prerequisites: a grade of C or better in MATH 105(P), MATH 108(P), or MATH 116(P); or Math Placement Level 30.
General Education Requirements: NS, QLB
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 208 Quantitative Models for Business
4 cr. Undergraduate.
Applications of algebra, functions, and optimization methods in business and economics settings.
Prerequisites: a grade of C or better in MATH 105(P), MATH 108(P), or MATH 116(P); or Math Placement Level 30.
General Education Requirements: QLB
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 211 Survey in Calculus and Analytic Geometry I
4 cr. Undergraduate.
A one-semester survey with applications to business administration, economics, and non-physical sciences. Topics include coordinate systems, equations of curves, limits, differentiation, integration, applications.
Prerequisites: a grade of C or better in MATH 105(P), MATH 108(P), or MATH 116(P); or Math Placement Level 30.
Course Rules: May not be used as a prerequisite for MATH 232. No cr for students with cr in MATH 213, MATH 221, or MATH 231.
General Education Requirements: NS, QLB
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 212 Survey in Calculus and Analytic Geometry II
4 cr. Undergraduate.
Continuation of first semester survey of calculus with applications to business administration, economics, and non-physical sciences. Topics include integration, multivariable calculus, Taylor polynomials and applications.
Prerequisites: grade of C or better in one of the following: MATH 208(P), MATH 211(P), MATH 213(P), MATH 221(P), or MATH 231(P).
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 213 Calculus with Life Sciences Applications
4 cr. Undergraduate.
Limits, derivatives, graphing. Antiderivatives, the definite integral, and the fundamental theorem of calculus. Additional techniques and applications pertinent to the life sciences throughout the course.
Prerequisites: a grade of C or better in MATH 115(P); or both Proficiency in Trigonometry (grade of C or better in MATH 117(P), or Level 26 or 36 on Math Placement Test) and Proficiency in Algebra (grade of C or better in MATH 116(P) or MATH 211(P), or Level 35 on Math Placement Test); or Math Placement Level 40.
Course Rules: No credit for students with credit in MATH 221 or MATH 231.
General Education Requirements: QLB, NS
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 221 Honors Calculus I
5 cr. Undergraduate.
Calculus of functions of one and several variables; sequences, series, differentiation, integration; introduction to differential equations; vectors and vector functions; applications.
Prerequisites: consent of instructor or Honors College Director and grade of A- or better in MATH 115(P), or in both of MATH 116(P) and MATH 117(P); or Level 40 on a Math Placement Test & ACT math subscore 30 or higher; or Math Placement Level 45.
Course Rules: Max 6 cr in combination of MATH 221 and MATH 222 may count toward Honors College requirements.
General Education Requirements: QLB, NS
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 222 Honors Calculus II
5 cr. Undergraduate.
Continuation of MATH 221.
Prerequisites: a grade of C or better in MATH 221(P) or a grade of B or better in MATH232(P); consent of instructor.
Course Rules: Max of 6 cr in combination of MATH 221 and MATH 222 may count toward Honors College requirements.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 231 Calculus and Analytic Geometry I
4 cr. Undergraduate.
Limits, derivatives, and graphs of algebraic, trigonometric, exponential, and logarithmic functions; antiderivatives, the definite integral, and the fundamental theorem of calculus, with applications.
Prerequisites: a grade of C or better in MATH 115(P); or both Proficiency in Trigonometry (grade of C or better in MATH 117(P), or Level 26 or 36 on Math Placement Test) and Proficiency in Algebra (grade of C or better in MATH 116(P) or MATH 211(P), or Level 35 on Math Placement Test); or Math Placement Level 40.
Course Rules: No credit for students with credit in MATH 213.
General Education Requirements: NS, QLB
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 232 Calculus and Analytic Geometry II
4 cr. Undergraduate.
Continuation of MATH 231. Applications of integration, techniques of integration; infinite sequences and series; parametric equations, conic sections, and polar coordinates.
Prerequisites: a grade of C or better in MATH 231(P) or a grade of B or better in MATH 213(P).
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 233 Calculus and Analytic Geometry III
4 cr. Undergraduate.
Continuation of MATH 232. Three-dimensional analytic geometry and vectors; partial derivatives; multiple integrals; vector calculus, with applications.
Prerequisites: grade of C or better in MATH 232(P).
Course Rules: Counts as repeat of MATH 229.
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 234 Linear Algebra and Differential Equations
4 cr. Undergraduate.
Elementary differential equations. Vectors; matrices; linear transformations; quadratic forms; eigenvalues; applications.
Prerequisites: grade of C or better in Math 232(P).
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 240 Matrices and Applications
3 cr. Undergraduate.
Vector spaces, systems of linear equations, matrices, determinants, linear transformations, eigenvalues, eigenvectors; selected topics in applications. Emphasizes basic concepts and concrete examples.
Prerequisites: a grade at least C in a MATH or MTHSTAT course numbered 200 or higher; or grade at least C in MATH 115(P); or both Proficiency in Trigonometry (a grade of C or better in MATH 117(P), or Level 26 or 36 on Math Placement Test) and Proficiency in Algebra (a grade of C or better in MATH 116(P) or MATH 211(P), or Level 35 on Math Placement Test); or Math Placement Level 40.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 275 Problem Solving/Critical Thinking for Elementary Education Majors
3 cr. Undergraduate.
Course provides a strong foundation in the exploration, teaching and communication (oral and written) of mathematical concepts via problem-solving experiences and discussion.
Prerequisites: grade of C or better in Math 175(P) or cons instr.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 276 Algebraic Structures for Elementary Education Majors
3 cr. Undergraduate.
Topics for K-8 teachers. Basic patterns and rules that govern number systems, geometric transformations, and manipulation of algebraic expressions.
Prerequisites: grade of C or better in Math 175(P) or cons instr.
Course Rules: Counts as repeat of Math 299 w/same topic.
Last Taught: Spring 2021, Spring 2020, Spring 2019, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 277 Geometry for Elementary Education Majors
3 cr. Undergraduate.
Topics for K-8 teachers. Geometry as measuring tool-congruence, similarity, area, volume, and coordinates; geometry as axiomatic system-definitions, conjectures, proofs, counterexamples; rigid motions, symmetry.
Prerequisites: grade of C or better in Math 176(P) or cons instr.
Last Taught: Fall 2022, Fall 2021, Fall 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 290 Topics in Mathematics:
3 cr. Undergraduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: satisfaction of Quantitative Literacy Part A GER.
Course Rules: May be retaken w/chg in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 297 Study Abroad:
1-12 cr. Undergraduate.
Designed to enroll students in UWM sponsored programs before course work level, content and credits are determined and/or in specially prepared program course work.
Prerequisites: acceptance for Study Abroad Program.
Course Rules: May be retaken with change in topic.
Last Taught: Spring 2025, Spring 2019, Fall 2018, Fall 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 299 Ad Hoc:
1-6 cr. Undergraduate.
Course created expressly for offering in a specified enrollment period. Requires only dept & assoc dean approval. In exceptional circumstances, can be offered in one add'l sem.
Prerequisites: none; add'l prereqs may be assigned to specific topic.
Course Rules: May be retaken w/chg in topic.
Last Taught: Spring 2012, Summer 2007, Spring 2007, Summer 2006.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 305 Introduction to Mathematical and Computational Modeling
3 cr. Undergraduate/Graduate.
Construction and analysis of discrete and continuous mathematical models in applied, natural, and social sciences. Elements of programming, simulations, case studies from scientific literature.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 211(P), and one additional 200-level or higher MATH or MTHSTAT course, or a grade of C or better in MATH 213(P) or MATH 231(P).
Course Rules: Counts as repeat of MATH 690(675) with topic 'Adv Math Models with Apps'.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 305G Introduction to Mathematical and Computational Modeling
3 cr. Undergraduate/Graduate.
Construction and analysis of discrete and continuous mathematical models in applied, natural, and social sciences. Elements of programming, simulations, case studies from scientific literature.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 211(P), and one additional 200-level or higher MATH or MTHSTAT course, or a grade of C or better in MATH 213(P) or MATH 231(P).
Course Rules: Counts as repeat of MATH 690(675) with topic 'Adv Math Models with Apps'.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 313 Linear Programming and Optimization
3 cr. Undergraduate/Graduate.
Primal and dual formulations of linear programming problems; simplex and related methods of solution; algorithms for transportation; optimization.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 234(P), ELECENG 234(P), or MATH 240(P); or graduate standing.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 313G Linear Programming and Optimization
3 cr. Undergraduate/Graduate.
Primal and dual formulations of linear programming problems; simplex and related methods of solution; algorithms for transportation; optimization.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 234(P), ELECENG 234(P), or MATH 240(P); or graduate standing.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 315 Mathematical Programming and Optimization
3 cr. Undergraduate/Graduate.
Introduction to operations research. Network analysis; integer programming; game theory; nonlinear programming; dynamic programming.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 234(P) or MATH 240(P); and a grade of C or better in MATH 211(P) or MATH 233(P); or graduate standing.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 315G Mathematical Programming and Optimization
3 cr. Undergraduate/Graduate.
Introduction to operations research. Network analysis; integer programming; game theory; nonlinear programming; dynamic programming.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 234(P) or MATH 240(P); and a grade of C or better in MATH 211(P) or MATH 233(P); or graduate standing.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 318 Topics in Discrete Mathematics
3 cr. Undergraduate.
Number theory topics related to cryptography; discrete structures including graphs, partial orders, Latin squares and block designs; advanced counting techniques.
Prerequisites: a grade of C or better in COMPSCI 317(P) or MATH 341(P).
Course Rules: COMPSCI 318 and MATH 318 are jointly offered and count as repeats of one another.
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 320 Introduction to Differential Equations
3 cr. Undergraduate/Graduate.
Elementary types and systems of differential equations, series solutions, numerical methods, Laplace transforms, selected applications.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 232(P) and MATH 240(P), or a grade of C or better in MATH 234(P) or ELECENG 234(P); or graduate standing.
Course Rules: No grad cr in Math Sci.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 320G Introduction to Differential Equations
3 cr. Undergraduate/Graduate.
Elementary types and systems of differential equations, series solutions, numerical methods, Laplace transforms, selected applications.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 232(P) and MATH 240(P), or a grade of C or better in MATH 234(P) or ELECENG 234(P); or graduate standing.
Course Rules: No grad cr in Math Sci.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 322 Introduction to Partial Differential Equations
3 cr. Undergraduate/Graduate.
Partial differential equations of mathematical physics, boundary value problems in heat flow, vibrations, potentials, etc. Solved by Fourier series; Bessel functions and Legendre polynomials.
Prerequisites: junior standing or consent of instructor; MATH 320(P); and a grade of C or better in MATH 233(P); or graduate standing.
Last Taught: Spring 2025, Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 322G Introduction to Partial Differential Equations
3 cr. Undergraduate/Graduate.
Partial differential equations of mathematical physics, boundary value problems in heat flow, vibrations, potentials, etc. Solved by Fourier series; Bessel functions and Legendre polynomials.
Prerequisites: junior standing or consent of instructor; MATH 320(P); and a grade of C or better in MATH 233(P); or graduate standing.
Last Taught: Spring 2025, Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 325 Vector Analysis
3 cr. Undergraduate/Graduate.
Topics selected from vector algebra; scalar and vector fields; line, surface, and volume integrals; theorems of Green, Gauss, and Stokes; vector differential calculus.
Prerequisites: junior standing or consent of instructor and a grade of C or better in MATH 233(P); or graduate standing.
Course Rules: Previously MATH 321.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 325G Vector Analysis
3 cr. Undergraduate/Graduate.
Topics selected from vector algebra; scalar and vector fields; line, surface, and volume integrals; theorems of Green, Gauss, and Stokes; vector differential calculus.
Prerequisites: junior standing or consent of instructor and a grade of C or better in MATH 233(P); or graduate standing.
Course Rules: Previously MATH 321.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 341 Seminar: Introduction to the Language and Practice of Mathematics
3 cr. Undergraduate.
Facility with mathematical language and method of conjecture, proof and counter example, with emphasis on proofs. Topics: logic, sets, functions and others.
Prerequisites: a grade of C or better in MATH 115(P); or both Proficiency in Trigonometry (a grade of C or better in MATH 117(P), or Level 26 or 36 on Math Placement Test) and Proficiency in Algebra (grade of C or better in MATH 116(P) or MATH 211(P), or Level 35 on Math Placement Test); or Math Placement Level 40.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 345 Mathematics from a Historical Perspective:
3 cr. Undergraduate.
Topics from the development of mathematics, such as famous problems, mathematicians, calculating devices; chronological outlines. Significant reading and writing assignments.
Prerequisites: a grade of C or better in MATH 212(P) or MATH 232(P) and satisfaction of OWC-A.
Course Rules: May be retaken with change in topic to 9 cr max. Additional prerequisites announced in the Schedule of Classes with each offering.
General Education Requirements: OWCB
Last Taught: Fall 2021, Fall 2019, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 381 Honors Seminar:
3 cr. Undergraduate.
Significant topics to illustrate to non-mathematicians the characteristic features of mathematical thought. Only H.S. algebra and geometry assumed.
Prerequisites: sophomore standing, HONORS 200(P), and consent of Honors College director.
Course Rules: May be retaken with change in topic to 9 cr max. Not open for cr toward a major in Math.
General Education Requirements: NS
Last Taught: Spring 2025, Fall 2015, Fall 2013, Spring 2011.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 405 Mathematical Models and Applications
3 cr. Undergraduate/Graduate.
Modeling techniques for analysis and decision-making in social and life sciences and industry. Deterministic and stochastic modeling. Topics may vary with instructors.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 211(P), or a grade of B or better in MATH 213(P), or a grade of C or better in MATH 231(P); and a grade of C or better in MATH 234(P), ELECENG 234(P), or MATH 240(P); or graduate standing.
Last Taught: Fall 2024, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 405G Mathematical Models and Applications
3 cr. Undergraduate/Graduate.
Modeling techniques for analysis and decision-making in social and life sciences and industry. Deterministic and stochastic modeling. Topics may vary with instructors.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 211(P), or a grade of B or better in MATH 213(P), or a grade of C or better in MATH 231(P); and a grade of C or better in MATH 234(P), ELECENG 234(P), or MATH 240(P); or graduate standing.
Last Taught: Fall 2024, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 413 Introduction to Numerical Analysis
3 cr. Undergraduate/Graduate.
Root finding and solution of nonlinear systems; direct solution of linear systems; interpolation & approximation of functions; least squares; fast Fourier transform; quadrature.
Prerequisites: junior standing or consent of instructor, grade of C or better in MATH 233(P), and either MATH 234(P) or ELECENG 234(P); or graduate standing.
Last Taught: Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 413G Introduction to Numerical Analysis
3 cr. Undergraduate/Graduate.
Root finding and solution of nonlinear systems; direct solution of linear systems; interpolation & approximation of functions; least squares; fast Fourier transform; quadrature.
Prerequisites: junior standing or consent of instructor, grade of C or better in MATH 233(P), and either MATH 234(P) or ELECENG 234(P); or graduate standing.
Last Taught: Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 415 Introduction to Scientific Computing
3 cr. Undergraduate/Graduate.
Nonlinear systems; iterative solution of linear systems; initial value problems in ordinary differential equations; boundary value problems in ordinary and partial differential equations.
Prerequisites: junior standing or consent of instructor, grade of C or better in MATH 233, and MATH 234 or ELECENG 234; or graduate standing.
Last Taught: Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 415G Introduction to Scientific Computing
3 cr. Undergraduate/Graduate.
Nonlinear systems; iterative solution of linear systems; initial value problems in ordinary differential equations; boundary value problems in ordinary and partial differential equations.
Prerequisites: junior standing or consent of instructor, grade of C or better in MATH 233, and MATH 234 or ELECENG 234; or graduate standing.
Last Taught: Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 417 Computational Linear Algebra
3 cr. Undergraduate/Graduate.
Direct solution of linear systems; iterative solution of linear systems; least squares; eigenvalue problems.
Prerequisites: junior standing or consent of instructor and a grade of C or better in MATH 234, ELECENG 234, or MATH 240; or graduate standing.
Last Taught: Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 417G Computational Linear Algebra
3 cr. Undergraduate/Graduate.
Direct solution of linear systems; iterative solution of linear systems; least squares; eigenvalue problems.
Prerequisites: junior standing or consent of instructor and a grade of C or better in MATH 234, ELECENG 234, or MATH 240; or graduate standing.
Last Taught: Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 431 Modern Algebra with Applications
3 cr. Undergraduate/Graduate.
Groups, rings, fields, Boolean algebras with emphasis on their applications to computer science and other areas.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 212 or MATH 232; or graduate standing.
Course Rules: Does not carry graduate credit in math sci.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 431G Modern Algebra with Applications
3 cr. Undergraduate/Graduate.
Groups, rings, fields, Boolean algebras with emphasis on their applications to computer science and other areas.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 212 or MATH 232; or graduate standing.
Course Rules: Does not carry graduate credit in math sci.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 451 Axiomatic Geometry
3 cr. Undergraduate/Graduate.
An axiomatic approach to Euclidean and non-Euclidean geometry (historic role of the parallel postulate and models).
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 341(P); or graduate standing.
Course Rules: Department consent required for graduate credit in math sci.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 451G Axiomatic Geometry
3 cr. Undergraduate/Graduate.
An axiomatic approach to Euclidean and non-Euclidean geometry (historic role of the parallel postulate and models).
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 341(P); or graduate standing.
Course Rules: Department consent required for graduate credit in math sci.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 489 Internship in Mathematics, Upper Division
1-6 cr. Undergraduate.
Application of advanced principles of mathematics in a business, organizational, educational, governmental, or other appropriate setting.
Prerequisites: junior standing or consent of instructor; 6 cr 300-level or above in MATH or MTHSTAT; 2.5 GPA in the major; consent of supervising faculty member.
Course Rules: One cr earned for academic work based on 40 hours in internship. May be retaken to 6 cr max.
Last Taught: Summer 2025, Fall 2024, Summer 2024, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 490 Topics in Mathematics:
3 cr. Undergraduate/Graduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: junior standing or consent of instructor; a grade of C or better in a 200+ MATH or MTHSTAT course; or graduate standing.
Course Rules: May be retaken with change in topic to 9 cr max.
Last Taught: Summer 2022, Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 490G Topics in Mathematics:
3 cr. Undergraduate/Graduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: junior standing or consent of instructor; a grade of C or better in a 200+ MATH or MTHSTAT course; or graduate standing.
Course Rules: May be retaken with change in topic to 9 cr max.
Last Taught: Summer 2022, Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 497 Study Abroad:
1-12 cr. Undergraduate/Graduate.
Designed to enroll students in UWM sponsored programs before course work level, content and credits are determined and/or in specially prepared program course work.
Prerequisites: junior standing and acceptance for Study Abroad Program.
Course Rules: May be retaken with change in topic.
Last Taught: Fall 2024, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 497G Study Abroad:
1-12 cr. Undergraduate/Graduate.
Designed to enroll students in UWM sponsored programs before course work level, content and credits are determined and/or in specially prepared program course work.
Prerequisites: junior standing and acceptance for Study Abroad Program.
Course Rules: May be retaken with change in topic.
Last Taught: Fall 2024, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 499 Ad Hoc:
1-6 cr. Undergraduate.
Course created expressly for offering in a specified enrollment period. Requires department and associate dean approval. In exceptional circumstances, can be offered in one additional semester.
Prerequisites: junior standing or consent of instructor; additional prerequisites may be assigned to a specific topic.
Course Rules: May be retaken with change in topic.
Last Taught: Spring 2010, Spring 2008, Fall 2007, Fall 1999.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 511 Symbolic Logic
3 cr. Undergraduate/Graduate.
First-order predicate calculus; formal properties of theoretical systems; chief results of modern mathematical logic; advanced topics such as completeness and computability.
Prerequisites: junior standing or consent of instructor; PHILOS 212(P) or 6 cr of MATH at the 300-level or above; or graduate standing.
Course Rules: COMPSCI 511, MATH 511 and PHILOS 511 are jointly offered and count as repeat of each other.
Last Taught: Spring 2019, Spring 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 511G Symbolic Logic
3 cr. Undergraduate/Graduate.
First-order predicate calculus; formal properties of theoretical systems; chief results of modern mathematical logic; advanced topics such as completeness and computability.
Prerequisites: junior standing or consent of instructor; PHILOS 212(P) or 6 cr of MATH at the 300-level or above; or graduate standing.
Course Rules: COMPSCI 511, MATH 511 and PHILOS 511 are jointly offered and count as repeat of each other.
Last Taught: Spring 2019, Spring 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 523 Advanced Calculus I
3 cr. Undergraduate/Graduate.
Fundamental notions of sets and functions; limits, continuity; Riemann integral, improper integral; infinite series; uniform convergence; power series; improper integrals with a parameter.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 232(P) and MATH 341(P); or graduate standing.
Course Rules: Previously MATH 521.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 523G Advanced Calculus I
3 cr. Undergraduate/Graduate.
Fundamental notions of sets and functions; limits, continuity; Riemann integral, improper integral; infinite series; uniform convergence; power series; improper integrals with a parameter.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 232(P) and MATH 341(P); or graduate standing.
Course Rules: Previously MATH 521.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 524 Advanced Calculus II
3 cr. Undergraduate/Graduate.
Linear functions; differentiation of functions of several variables (implicit functions, Jacobians); change of variable in multiple integrals; integrals over curves, surfaces; Green, Gauss, Stokes theorems.
Prerequisites: junior standing or consent of instructor, MATH 523(521)(P), a grade of C or better in MATH 233(P), and a grade of C or better in MATH 234(P) or MATH 240(P); or graduate standing.
Course Rules: Previously MATH 522.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 524G Advanced Calculus II
3 cr. Undergraduate/Graduate.
Linear functions; differentiation of functions of several variables (implicit functions, Jacobians); change of variable in multiple integrals; integrals over curves, surfaces; Green, Gauss, Stokes theorems.
Prerequisites: junior standing or consent of instructor, MATH 523(521)(P), a grade of C or better in MATH 233(P), and a grade of C or better in MATH 234(P) or MATH 240(P); or graduate standing.
Course Rules: Previously MATH 522.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 529 Structure of Real and Complex Numbers
3 cr. Undergraduate/Graduate.
Construction of the real and complex number systems; topology of the real line and the complex plane; sequences and series of complex numbers.
Prerequisites: junior standing or consent of instructor, and MATH 341(P); or graduate standing.
Last Taught: Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 529G Structure of Real and Complex Numbers
3 cr. Undergraduate/Graduate.
Construction of the real and complex number systems; topology of the real line and the complex plane; sequences and series of complex numbers.
Prerequisites: junior standing or consent of instructor, and MATH 341(P); or graduate standing.
Last Taught: Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 531 Modern Algebra
3 cr. Undergraduate/Graduate.
Integers; groups; rings; fields; emphasis on proofs.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 341(P).
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 531G Modern Algebra
3 cr. Undergraduate/Graduate.
Integers; groups; rings; fields; emphasis on proofs.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 341(P).
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 535 Linear Algebra
3 cr. Undergraduate/Graduate.
Vector spaces; systems of linear equations; linear transformations and matrices; bilinear, quadratic, and Hermitian forms; eigentheory; canonical forms; selected topics. Emphasizes theory and proof.
Prerequisites: junior standing or consent of instructor, a grade of C or better in MATH 234(P) or MATH 240(P), and a grade of C or better in MATH 341(P); or graduate standing.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 535G Linear Algebra
3 cr. Undergraduate/Graduate.
Vector spaces; systems of linear equations; linear transformations and matrices; bilinear, quadratic, and Hermitian forms; eigentheory; canonical forms; selected topics. Emphasizes theory and proof.
Prerequisites: junior standing or consent of instructor, a grade of C or better in MATH 234(P) or MATH 240(P), and a grade of C or better in MATH 341(P); or graduate standing.
Last Taught: Fall 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 537 Number Theory
3 cr. Undergraduate/Graduate.
Number theoretic functions; distribution of primes; Diophantine approximation; partitions; additive number theory; quadratic reciprocity.
Prerequisites: junior standing or consent of instructor, and grade of C or better in MATH 232(P) and MATH 341(P); or graduate standing.
Last Taught: Spring 2019, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 537G Number Theory
3 cr. Undergraduate/Graduate.
Number theoretic functions; distribution of primes; Diophantine approximation; partitions; additive number theory; quadratic reciprocity.
Prerequisites: junior standing or consent of instructor, and grade of C or better in MATH 232(P) and MATH 341(P); or graduate standing.
Last Taught: Spring 2019, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 551 Elementary Topology
3 cr. Undergraduate/Graduate.
General theory of point sets in Euclidean spaces, with emphasis on topology of two-dimensional and three-dimensional spaces; elementary notions of metric spaces; applications.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 233(P) and MATH 341(P); or graduate standing.
Last Taught: Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 551G Elementary Topology
3 cr. Undergraduate/Graduate.
General theory of point sets in Euclidean spaces, with emphasis on topology of two-dimensional and three-dimensional spaces; elementary notions of metric spaces; applications.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 233(P) and MATH 341(P); or graduate standing.
Last Taught: Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 553 Differential Geometry
3 cr. Undergraduate/Graduate.
The theory of curves and surfaces by differential methods.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 233(P), MATH 234(P), and MATH 341(P); or graduate standing.
Last Taught: Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 553G Differential Geometry
3 cr. Undergraduate/Graduate.
The theory of curves and surfaces by differential methods.
Prerequisites: junior standing or consent of instructor, and a grade of C or better in MATH 233(P), MATH 234(P), and MATH 341(P); or graduate standing.
Last Taught: Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 575 High School Mathematics from an Advanced Viewpoint
3 cr. Undergraduate/Graduate.
Number systems; algebra of polynomials; theory of equations; functions; modeling; geometric measurement; geometric transformations; connections between advanced mathematics and high school topics.
Prerequisites: junior standing or consent of instructor, MATH 341(P) and an additional 6 credits of Math at the 300 level or above; or graduate standing.
Course Rules: Counts as repeat of MATH 690 with similar topic.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 575G High School Mathematics from an Advanced Viewpoint
3 cr. Undergraduate/Graduate.
Number systems; algebra of polynomials; theory of equations; functions; modeling; geometric measurement; geometric transformations; connections between advanced mathematics and high school topics.
Prerequisites: junior standing or consent of instructor, MATH 341(P) and an additional 6 credits of Math at the 300 level or above; or graduate standing.
Course Rules: Counts as repeat of MATH 690 with similar topic.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 583 Introduction to Probability Models
3 cr. Undergraduate.
Probability review, Markov chains in discrete and continuous time. Random walks, branching processes, birth and death processes. Queuing theory. Applications to physical sciences, engineering, mathematics.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 233(P); a grade of C or better in MATH 234(P) or ELECENG 234(P), or in both MATH 240(P) and MATH 320(P); and one calculus-based course in statistics or probability at the 300 level or above; or graduate standing.
Course Rules: Previously MATH 571.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 591 Undergraduate Seminar:
1 cr. Undergraduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: junior standing or consent of instructor.
Course Rules: May be retaken with change in topic to 4 cr max.
Last Taught: Spring 2023, Fall 2022, Spring 2018, Fall 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 599 Capstone Experience
1 cr. Undergraduate.
Student writes a paper under supervision of an advisor on an approved topic not covered in the student's regular course work.
Prerequisites: senior standing and consent of instructor.
Course Rules: May be retaken with change in topic to 2 cr max.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 603 Advanced Engineering Mathematics I
3 cr. Undergraduate.
Sequences and series, elementary complex analysis; Fourier series; linear and nonlinear ordinary differential equations; matrix theory, elementary functional analysis; elementary solution of partial differential equations.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 233 and either MATH 234 or ELECENG 234; 3 cr Math at 300-level or above; or graduate standing.
Course Rules: Previously MATH 601.
Last Taught: Fall 2024, Fall 2020, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 604 Advanced Engineering Mathematics II
3 cr. Undergraduate.
Continuation of MATH 603(601). Partial differential equations, Fourier and Laplace transforms, convolutions, special functions, mathematical modeling.
Prerequisites: junior standing or consent of instructor, and MATH 603(601)(P).
Course Rules: Previously MATH 602.
Last Taught: Spring 2021, Spring 2019, Spring 2017, Spring 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 610 Numerical Solution of Partial Differential Equations
3 cr. Undergraduate.
Finite difference solution of elliptic boundary value problems and of evolution problems; solution of hyperbolic conservation laws; finite volume methods; finite element methods.
Prerequisites: junior standing or consent of instructor; MATH 413(P), MATH 415(414)(P), or MATH 417(416)(P); and MATH 322(P) or MATH 604(602)(P); or consent of instructor.
Course Rules: Previously MATH 615.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 617 Optimization
3 cr. Undergraduate.
Unconstrained and constrained optimization: linear, nonlinear, and dynamic programming; barrier, penalty, and Lagrangian methods; Karush-Kuhn-Tucker theory, quadratic, and sequential quadratic programming; evolutionary algorithms.
Prerequisites: junior standing or consent of instructor, and MATH 325(321)(P) or MATH 604(602)(P); or graduate standing.
Last Taught: Spring 2022, Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 623 Introduction to Analysis I
3 cr. Undergraduate.
Topology of Euclidean space; continuity; differentiation of real and vector-valued functions; Riemann-Stieltjes integration.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 233(P), MATH 341(P), and either MATH 234(P) or MATH 240(P); consent of department advisor; or graduate standing.
Course Rules: Previously MATH 621.
Last Taught: Fall 2024, Fall 2023, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 624 Introduction to Analysis II
3 cr. Undergraduate.
Continuation of MATH 623(621). Sequences and series of functions; uniform convergence; power series; functions of several variables; inverse and implicit function theorems; differential forms; Stokes' theorem.
Prerequisites: junior standing and MATH 623(621)(P); or consent of instructor; or graduate standing.
Course Rules: Previously MATH 622.
Last Taught: Spring 2024, Spring 2022, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 635 Modern Algebra I
3 cr. Undergraduate.
Group theory, including normal subgroups, quotients, permutation groups, Sylow's theorems, Abelian groups; field theory; linear algebra over general fields.
Prerequisites: junior standing or consent of instructor; a grade of C or better in MATH 341(P) and either MATH 234(P) or MATH 240(P); consent of department advisor; or graduate standing.
Course Rules: Previously MATH 631.
Last Taught: Fall 2024, Fall 2023, Fall 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 636 Modern Algebra II
3 cr. Undergraduate.
Continuation of MATH 635(631). Ring theory, including ideals, quotient rings, Euclidean rings, polynomial rings, unique factorization; modules, including vector spaces, linear transformations, canonical forms; bilinear forms.
Prerequisites: junior standing and MATH 635(631)(P); or consent of instructor; or graduate standing.
Course Rules: Previously MATH 632.
Last Taught: Spring 2025, Spring 2024, Spring 2022, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 690 Topics in Mathematics:
3 cr. Undergraduate/Graduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: junior standing or consent of instructor, and at least one U/G MATH or MTHSTAT course; or graduate standing.
Course Rules: May be retaken with change in topic to 9 cr max.
Last Taught: Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 690G Topics in Mathematics:
3 cr. Undergraduate/Graduate.
Specific topics and any additional prerequisites announced in Schedule of Classes each time course is offered.
Prerequisites: junior standing or consent of instructor, and at least one U/G MATH or MTHSTAT course; or graduate standing.
Course Rules: May be retaken with change in topic to 9 cr max.
Last Taught: Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 699 Independent Reading
1-3 cr. Undergraduate.
See Advanced Independent Study. For further information, consult department chair.
Prerequisites: junior standing or consent of instructor; 2.0 GPA, consent of department chair, and Assistant Dean for Student Academic Services.
Course Rules: May be retaken with change in topic.
Last Taught: Spring 2023, Fall 2022, Summer 2022, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 703 Advanced Engineering Mathematics I
3 cr. Graduate.
Sequences and series, elementary complex analysis; Fourier series; linear and nonlinear ordinary differential equations; matrix theory, elementary functional analysis; elementary solution of partial differential equations.
Prerequisites: graduate standing; or junior standing; grade of C or better in both MATH 233(P) and MATH/ELECENG 234(P); 3 cr MATH at 300-level or above; or consent of instructor.
Course Rules: No credit for students with credit in MATH 603.
Last Taught: Fall 2024, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 704 Advanced Engineering Mathematics II
3 cr. Graduate.
Continuation of MATH 703. Partial differential equations, Fourier and Laplace transforms, convolutions, special functions, mathematical modeling.
Prerequisites: graduate standing and MATH 703(P).
Course Rules: No credit for students with credit in MATH 604.
Last Taught: Spring 2025, Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 710 Numerical Solution of Partial Differential Equations
3 cr. Graduate.
Finite difference and finite element methods for boundary value and evolution problems; solution of hyperbolic conservation laws; consistency, convergence, and stability; iterative methods for related linear systems.
Prerequisites: graudate standing; MATH 413(P), MATH 415(414)(P), or MATH 417(416)(P); MATH 322(P), MATH 604(602)(P), or MATH 704(P); or consent of instructor.
Course Rules: No credit for students with credit in MATH 610(615). Previously MATH 707.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 717 Optimization
3 cr. Graduate.
Introduction of numerical algorithms for unconstrained and constrained optimization, nonlinear programming, least-squares problems, quadratic programming, Karush-Kuhn-Tucker theory, penalty and augmented Lagrangian methods.
Prerequisites: graduate standing; MATH 313(P), MATH 315(P), MATH 417(P), MATH 604(602)(P), or MATH 704(P); or consent of instructor.
Course Rules: No credit for students with credit in MATH 617. Previously MATH 708.
Last Taught: Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 723 Introduction to Analysis I
3 cr. Graduate.
Topology of Euclidean space; continuity; differentiation of real and vector-valued functions; Riemann-Stieltjes integration.
Prerequisites: graduate standing; consent of instructor.
Course Rules: No credit for students with credit in MATH 623(621).
Last Taught: Fall 2024, Fall 2023, Fall 2022, Spring 1987.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 724 Introduction to Analysis II
3 cr. Graduate.
Continuation of MATH 723. Sequences and series of functions; uniform convergence; power series; functions of several variables; inverse and implicit function theorems; differential forms; Stokes' theorem.
Prerequisites: graduate standing; MATH 723(P) or consent of instructor.
Course Rules: No credit for students with credit in MATH 624(622). Previously MATH 722.
Last Taught: Spring 2025, Spring 2024, Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 735 Modern Algebra I
3 cr. Graduate.
Group theory, including normal subgroups, quotients, permutation groups, Sylow's theorems, Abelian groups; field theory; linear algebra over general fields.
Prerequisites: graduate standing.
Course Rules: No credit for students with credit in MATH 635(631).
Last Taught: Fall 2024, Fall 2023, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 736 Modern Algebra II
3 cr. Graduate.
Continuation of MATH 735. Ring theory, including ideals, quotient rings, Euclidean rings, polynomial rings, unique factorization; modules, including vector spaces, linear transformations, canonical forms; bilinear forms.
Prerequisites: graduate standing.
Course Rules: No credit for students with credit in MATH 636(632).
Last Taught: Spring 2025, Spring 2024, Spring 2023, Fall 2005.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 783 Introduction to Probability Models
3 cr. Graduate.
Probability review, Markov chains in discrete and continuous time. Random walks, branching processes, birth and death processes. Queuing theory. Applications to physical sciences, engineering, mathematics.
Prerequisites: graduate standing or consent of instructor; recommended are courses in multivariable calculus, elementary linear algebra and differential equations, and one calculus-based course in statistics or probability at the 300 level or above.
Course Rules: No credit for students with credit in MATH 583(571).
Last Taught: Spring 2025, Spring 2024, Spring 2023, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 799 Seminar in Mathematics:
1-3 cr. Graduate.
Specific topics and any additional prerequisites announced in Timetable each time course is offered.
Prerequisites: graduate standing and consent of instructor.
Course Rules: Retakable with change in topic to 9 cr max.
Last Taught: Fall 2024, Fall 2023, Fall 2022, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 803 Industrial Mathematics I
3 cr. Graduate.
Elementary functional analysis, wavelets, control theory. Use of mathematical software emphasized throughout.
Prerequisites: graduate standing in natural science discipline; MATH 524(522)(P), MATH 604(602)(P), MATH 624(622)(P), or MATH 704(P).
Course Rules: Previously MATH 701.
Last Taught: Fall 2021, Fall 2019, Fall 2017, Fall 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 804 Industrial Mathematics II
3 cr. Graduate.
Optimal control theory, digital signal processing, image processing, linear programming, nonlinear optimation, artificial neural networks. Use of mathematical software emphasized throughout.
Prerequisites: graduate standing in natural science discipline; MATH 803(701)(P).
Course Rules: Previously MATH 702.
Last Taught: Spring 2022, Spring 2020, Spring 2018, Spring 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 807 Group Theory and Its Applications to Physics
3 cr. Graduate.
Representations of discrete and continuous groups, including rotation groups, unitary groups and crystal point and space groups. Symmetries of elementary particles. Molecular obitals, energy bands.
Prerequisites: grad st; Physics 532(P).
Course Rules: Counts as a repeat of Physics 807.
Last Taught: Spring 2021, Spring 2019, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 810 Numerical Analysis I
3 cr. Graduate.
Polynomial interpolation and approximation; numerical differentiation and integration; direct and iterative methods for linear systems; and iterative methods for nonlinear algebraic equations.
Prerequisites: graduate standing; MATH 413(P); MATH 523(521)(P), MATH 623(621)(P), or MATH 723(P).
Course Rules: Previously MATH 715.
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 811 Numerical Analysis II
3 cr. Graduate.
Numerical methods for initial value problems of ordinary differential equations; gradient descent and conjugate gradient methods and preconditioning techniques for solving large scale sparse linear systems; orthogonal polynomials and least squares techniques.
Prerequisites: graduate standing; MATH 810(P) or consent of instructor.
Course Rules: Previously MATH 805.
Last Taught: Spring 2025, Spring 1993, Fall 1985.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 816 Ordinary Differential Equations
3 cr. Graduate.
Existence and uniqueness theorems for systems of ode; qualitative properties of solutions, including stability and asymptotic behavior; general theory of linear systems; sturm-liouville problems.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 624(622)(P), or MATH 724(P).
Course Rules: No credit for students with credit in MATH 716.
Last Taught: Fall 2023, Spring 2010, Spring 2006, Spring 2004.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 819 Partial Differential Equations
3 cr. Graduate.
First and second order equations; characteristics, cauchy problem; classical solutions of linear elliptic, parabolic and hyperbolic equations.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 624(622)(P), or MATH 724(P); MATH 320(P).
Course Rules: No credit for students with credit in MATH 719.
Last Taught: Spring 2024, Fall 2000, Fall 1996, Spring 1996.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 823 Theory of Functions of a Real Variable I
3 cr. Graduate.
Equivalence relations; cardinal and ordinal numbers; topology of real line; cantor and borel sets; lebesgue measure on real line; baire and measurable functions; lebesgue integral.
Prerequisites: graduate standing; MATH 524(522)(P) and MATH 551(P); or MATH 624(622)(P) or MATH 724(P).
Course Rules: No credit for students with credit in MATH 711.
Last Taught: Fall 2024, Fall 2023, Fall 2022, Spring 1989.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 824 Theory of Functions of a Real Variable II
3 cr. Graduate.
Lebesgue integration; modes of convergence; lp spaces; vitali covering and lebesgue density theorems; dini derivates; differentiation; fundamental theorem of the lebesgue integral calculus; fubini's theorem.
Prerequisites: graduate standing; MATH 823(P).
Course Rules: Previously MATH 712.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 825 Functional Analysis I
3 cr. Graduate.
Basic notions of functional analysis in hilbert space will be introduced. The concepts will be illustrated by applications to elementary differential and integral equation problems.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 624(622)(P), or MATH 724(P).
Course Rules: No credit for students with credit in MATH 726.
Last Taught: Fall 2023, Spring 2013, Fall 1998, Fall 1994.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 826 Functional Analysis II
3 cr. Graduate.
Continuation of MATH 825.
Prerequisites: graduate standing and MATH 825(P).
Last Taught: Spring 1999, Spring 1994, Spring 1993.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 827 Theory of Functions of a Complex Variable I
3 cr. Graduate.
Complex numbers; linear transformations; elementary functions; conformal mapping; complex integration; infinite sequences; dirichlet problem; multivalued functions.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 623(621)(P), or MATH 723(P).
Course Rules: No credit for students with credit in MATH 713.
Last Taught: Spring 2025, Fall 2024, Fall 2022, Spring 1995.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 828 Theory of Functions of a Complex Variable II
3 cr. Graduate.
Continuation of MATH 827.
Prerequisites: graduate standing; MATH 827(P).
Course Rules: Previously MATH 714.
Last Taught: Spring 2025, Spring 2023, Spring 2021, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 835 Abstract Algebra I
3 cr. Graduate.
Basic course which is prerequisite for all other 800-899 level courses in algebra; groups, rings, fields, galois theory, modules, and categories.
Prerequisites: graduate standing; MATH 636(632)(P) or MATH 736(P); consent of instructor.
Course Rules: Previously MATH 731.
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 836 Abstract Algebra II
3 cr. Graduate.
Continuation of MATH 835(731).
Prerequisites: graduate standing; MATH 835(731)(P).
Course Rules: Previously MATH 732.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 843 Homological Algebra I
3 cr. Graduate.
Modules; diagrams; categories; functors; complexes; cohomology; extensions; resolutions; injective and projective systems; graded modules; homological dimension; spectral sequences; derived functors.
Prerequisites: graduate standing; MATH 835(731)(P).
Last Taught: Fall 2019, Fall 2015, Fall 2010, Fall 2002.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 844 Homological Algebra II
3 cr. Graduate.
Continuation of Math 843.
Prerequisites: grad st; Math 843(P).
Last Taught: Spring 2020, Spring 2016, Spring 2011, Spring 2003.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 853 Differential Geometry
3 cr. Graduate.
Theory of curves, surfaces, and manifolds in modern terminology. Global results on closed surfaces, geodesics, differential forms and tensor calculus. Introduction to Riemannian geometry.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 624(622)(P), or MATH 724(P).
Course Rules: Previously MATH 709.
Last Taught: Fall 2007, Fall 2000.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 854 Topics in Differential Geometry:
1-3 cr. Graduate.
Topics may be selected from Riemannian geometry, minimal surfaces and surfaces of prescribed mean curvature, geometric partial differential equations, or related areas of geometry.
Prerequisites: graduate standing; consent of instructor.
Course Rules: Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered. Retakable with change in topic to 24 cr max. Previously MATH 809.
Last Taught: Spring 2008, Spring 2001.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 855 Introductory Topology I
3 cr. Graduate.
Fundamental properties and examples of topological spaces and continuous functions, including compactness, connectedness, metrizability, completeness, product and quotient spaces, homeomorphisms, embedding, extension, and euclidean spaces.
Prerequisites: graduate standing; MATH 524(522)(P), MATH 623(621)(P), or MATH 723(P).
Course Rules: Previously MATH 751.
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 856 Introductory Topology II
3 cr. Graduate.
Continuation of MATH 855(751).
Prerequisites: graduate standing; MATH 855(751)(P).
Course Rules: Previously MATH 752.
Last Taught: Spring 2025, Spring 2024, Spring 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 857 Introduction to Algebraic Topology I
3 cr. Graduate.
Homology theory; complexes and simplicial homology theory; general homology theories; cohomology rings; applications to manifolds, fixed point theorems, etc.
Prerequisites: graduate standing; MATH 636(632)(P) or MATH 736(P); MATH 551(P) or MATH 855(751)(P) or consent of instructor.
Course Rules: No credit for students with credit in MATH 753.
Last Taught: Fall 2024, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 858 Introduction to Algebraic Topology II
3 cr. Graduate.
Continuation of MATH 857.
Prerequisites: graduate standing; MATH 857(P).
Course Rules: Previously MATH 754.
Last Taught: Spring 2025, Spring 2023, Spring 2021, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 883 Theory of Probability
3 cr. Graduate.
Measure-theoretic foundations; limit-law theorems; weak and strong laws of large numbers; central limit problem; conditional expectations, martingales; stochastic processes.
Prerequisites: graduate standing; MATH 824(712)(C).
Course Rules: Previously MATH 771.
Last Taught: Fall 2023, Spring 2022, Spring 2020, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 884 Stochastic Calculus and Applications
3 cr. Graduate.
Basic stochastic analysis and control theories and techniques; their applications to model and analyze real-world applications in which random noises are inherent.
Prerequisites: graduate standing; MATH 883(P) or consent of instructor.
Course Rules: Previously MATH 777.
Last Taught: Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 888 Candidate for Degree
0 cr. Graduate.
Available for graduate students who must meet minimum credit load requirement.
Prerequisites: graduate standing.
Course Rules: Fee for 1 cr assessed; unit does not count towards credit load for Fin Aid. Repeatable. Satisfactory/Unsatisfactory only.
Last Taught: Summer 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 890 Master's Thesis
1-3 cr. Graduate.
Course for students completing supervised Master's Thesis.
Prerequisites: graduate standing; consent of instructor.
Course Rules: Credit(s) count toward Master's degree only if student completes thesis option. Repeatable to 12 cr max. Previously MATH 790.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Summer 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 891 Master's Seminar
1-3 cr. Graduate.
Course for students completing Master's Project.
Prerequisites: graduate standing; consent of instructor.
Course Rules: May not be taken for credit more than once. Previously MATH 791.
Last Taught: Spring 2020, Summer 2018, Spring 2014, Fall 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 892 Industrial Internship
1-3 cr. Graduate.
Students earn credits for serving in an industrial internship that involves work of an advanced mathematical nature. They must prepare a report based on the internship.
Prerequisites: graduate standing; consent of instructor.
Course Rules: Retakable to 6 cr max. Previously MATH 792.
Last Taught: Summer 2022, Summer 2021, Summer 2019, Summer 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 893 Scientific Computational Laboratory:
1-2 cr. Graduate.
Scientific programming and numerical study (in Python/Matlab) on numerical algorithms for solving linear and nonlinear systems, data interpolation/fitting, and differential equations (initial and boundary value problems).
Prerequisites: graduate standing; MATH 810(715)(C).
Course Rules: Retakable with change in topic to 6 cr max. Previously MATH 793.
Last Taught: Fall 2022, Spring 2021, Spring 2019, Spring 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 899 Seminar in Advanced Mathematics
1-3 cr. Graduate.
Specific topics and any additional prerequisites announced in the Schedule of Classes each time course is offered.
Prerequisites: graduate standing and consent of instructor.
Course Rules: Retakable with change in topic to 24 cr max.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 901 Topics in Applied Mathematics:
3 cr. Graduate.
Specific topics in applied mathematics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing; consent of instructor.
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 801.
Last Taught: Spring 2022, Fall 2021, Fall 2018, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 910 Topics in Numerical Analysis:
3 cr. Graduate.
Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing; MATH 810(715)(P).
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 815.
Last Taught: Spring 2024, Spring 2022, Spring 2020, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 921 Advanced Topics in Real Analysis:
3 cr. Graduate.
Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing; MATH 824(712)(P).
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 821.
Last Taught: Spring 2019, Fall 2017, Fall 2012, Fall 1998.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 941 Advanced Topics in Algebra:
3 cr. Graduate.
Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing; MATH 836(732)(P); consent of instructor.
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 841.
Last Taught: Fall 2023, Fall 2022, Spring 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 951 Advanced Topics in Topology:
3 cr. Graduate.
Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing; MATH 856(752)(P); consent of instructor.
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 851.
Last Taught: Spring 2025, Spring 2024, Fall 2023, Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 983 Advanced Topics in Probability:
3 cr. Graduate.
Specific topics and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.
Prerequisites: graduate standing and consent of instructor.
Course Rules: Retakable with change in topic to 24 cr max. Previously MATH 873.
Last Taught: Fall 2024, Spring 2024, Fall 2023, Fall 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

MATH 990 Reading and Research
1-6 cr. Graduate.
To be arranged with your instructor and department chair.
Prerequisites: grad st.
Course Rules: Retakable.
Last Taught: Summer 2025, Spring 2025, Fall 2024, Summer 2024.
Current Offerings: https://catalog.uwm.edu/course-search/