MATHEMATICS (MATH)

MATH 1011Q. Introductory College Algebra and Mathematical Modeling. (3 Credits)
Emphasizes two components necessary for success in 1000-level courses which employ mathematics. The first component consists of basic algebraic notions and their manipulations. The second component consists of the practice of solving multi-step problems from other disciplines, called mathematical modeling. The topics include: lines, systems of equations, polynomials, rational expressions, exponential and logarithmic functions. Students will engage in group projects in mathematical modeling. Strongly recommended as preparation for Q courses for students whose high school algebra needs reinforcement. Not open to students who have passed a Q course.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201011Q)

MATH 1020Q. Problem Solving. (3 Credits)
An introduction to the techniques used by mathematicians to solve problems. Skills such as Externalization (pictures and charts), Visualization (associated mental images), Simplification, Trial and Error, and Lateral Thinking learned through the study of mathematical problems. Problems drawn from combinatorics, probability, optimization, cryptology, graph theory, and fractals. Students will be encouraged to work cooperatively and to think independently. Not eligible for course credit by examination.
Recommended preparation: MATH 1011 or equivalent. Not open for credit to students who have passed any math course other than MATH 1010, 1011, 1020, 1030, 1040, 1050, 1060 or 1070.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201020Q)

MATH 1030Q. Elementary Discrete Mathematics. (3 Credits)
Topics chosen from discrete mathematics. May include counting and probability, sequences, graph theory, deductive reasoning, the axiomatic method and finite geometries, number systems, voting methods, apportionment methods, mathematics of finance, number theory.
Recommended preparation: MATH 1011 or equivalent. Not open for credit to students who have passed any math course other than MATH 1010, 1011, 1020, 1030, 1040, 1050, 1060 or 1070.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201030Q)

MATH 1040Q. Elementary Mathematical Modeling. (3 Credits)
Use of algebraic and trigonometric functions with technology to analyze quantitative relationships and illustrate the role of mathematics in modern life; graphical numerical and symbolic methods. Most sections require a graphing calculator; some require work with a computer spreadsheet. This course should not be considered as adequate preparation for MATH 1071, 1120, 1131, or 1151.
Recommended preparation: MATH 1011 or equivalent. Not open to students who have passed any MATH course other than MATH 1010, 1011,1020, 1030, 1040, 1050, 1070. This course and MATH 1060 cannot both be taken for credit.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201040Q)

MATH 1060Q. Precalculus. (3 Credits)
Preparation for calculus. Review of algebra. Functions and their applications; in particular, polynomials, rational functions, exponentials, logarithms and trigonometric functions.
A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement). May not be taken out of sequence after passing MATH 1120,1125, or 1131. Not open for credit after passing MATH 1040.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201060Q)

MATH 1070Q. Mathematics for Business and Economics. (3 Credits)
Linear equations and inequalities, matrices, systems of linear equations, and linear programming; sets, counting, probability and statistics; mathematics of finance; applications to business and economics.
Recommended preparation: MATH 1011Q or equivalent. Not open for credit to students who have passed MATH 1132Q, 1152Q or 2142Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201070Q)

MATH 1071Q. Calculus for Business and Economics. (3 Credits)
Derivatives and integrals of algebraic, exponential and logarithmic functions. Applications to business and economics.
Recommended preparation: MATH 1011Q or the equivalent, and MATH 1070Q, and a qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement). Not open to students who have passed MATH 1110Q. Only one credit for students who have passed MATH 1121Q, 1131Q, or 1151Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201071Q)

MATH 1131Q. Calculus I. (4 Credits)
Limits, continuity, differentiation, antidifferentiation, definite integral, with applications to the physical sciences and engineering sciences. Suitable for students with some prior calculus experience. Substitutes for MATH 1120, 1126 or 1151 as a requirement. Two credits for students who have passed MATH 1125.
A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement). Students cannot receive credit for MATH 1131Q and either MATH 1120Q, 1121Q, 1126Q, or 1151Q (2 credits for students who have passed MATH 1125Q). May not be taken out of sequence after passing MATH 1132Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201131Q)

MATH 1132Q. Calculus II. (4 Credits)
Transcendental functions, formal integration, polar coordinates, infinite sequences and series, vector algebra and geometry, with applications to the physical sciences and engineering. Substitutes for MATH 1122 as a requirement.
A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement); one of MATH 1121Q, 1126Q, 1131Q, or 1151Q, or AP credit for calculus. Recommended preparation: C- or better in MATH 1121Q or MATH 1126Q or 1131Q. Not open to students who have passed MATH 1122Q or 1152Q. Substitutes for MATH 1122Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201132Q)

MATH 1151Q. Honors Calculus I. (4 Credits)
The subject matter of MATH 1131 in greater depth, with emphasis on the underlying mathematical concepts. May be used in place of MATH 1131 to fulfill any requirement satisfied by MATH 1131.
A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement). Students cannot receive credit for MATH 1151 and either MATH 1121 or 1131.
Grading Basis: Honors Credit
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201151Q)

MATH 1152Q. Honors Calculus II. (4 Credits)
The subject matter of MATH 1132 in greater depth, with emphasis on the underlying mathematical concepts. May be used in place of MATH 1132 to fulfill any requirement satisfied by MATH 1132.
A qualifying score on the math placement assessment (placement.uconn.edu/mathematics-placement); MATH 1151Q or AP credit for calculus, or consent of instructor. Students cannot receive credit for MATH 1152Q and either MATH 1122Q or 1132Q.
Grading Basis: Honors Credit
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201152Q)

MATH 1793. Foreign Study. (1-15 Credits)
Consent of the Department Head or Undergraduate Coordinator required, normally before the student's departure. May count toward the major with consent of the advisor and either the department head or undergraduate coordinator.
May be repeated for credit to a maximum of 15 for MATH 1793, 2793, and 3793 together.
May be repeated for a total of 15 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201793)

MATH 1795Q. Special Topics Lecture. (1-3 Credits)
Credits, prerequisites and hours as determined by the Senate Curricula and Courses Committee.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%201795Q)

MATH 2010Q. Fundamentals of Algebra and Geometry. (3 Credits)
Development of the number system with applications to elementary number theory and analytic geometry. May not be counted in any of the major groups described in the Mathematics Departmental listing.
PSYC 1100 and three credits of Mathematics; open only to students enrolled in the Elementary Education program in the Neag School of Education or by consent of instructor. May not be taken out of sequence after passing MATH 2011Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202010Q)

MATH 2011Q. Fundamentals of Algebra and Geometry. (3 Credits)
A continuation of MATH 2010Q, furthering the treatment of elementary number theory and analytic geometry.
MATH 2010Q. May not be counted in any of the major groups described in the Mathematics Departmental listing.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202011Q)

MATH 2110Q. Multivariable Calculus. (4 Credits)
Two- and three-dimensional vector algebra, calculus of functions of several variables, vector differential calculus, line and surface integrals. MATH 1132Q or 1152Q or a score of 4 or 5 on the AP Calculus BC exam. Recommended preparation: a grade of C- or better in MATH 1132Q. May not be taken for credit after passing MATH 2130Q or 2143Q. May not be taken out of sequence after passing MATH 2720, 3146, 3160, 3330, 3370, 3410, 3412, 3510, or 3610. Repeat restrictions apply; see advising.uconn.edu/repeat-policy.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202110Q)

MATH 2130Q. Honors Multivariable Calculus. (4 Credits)
(Honors Course) The subject matter of MATH 2110 in greater depth, with emphasis on the underlying mathematical concepts. May be used in place of MATH 2110 to fulfil any requirement satisfied by MATH 2110. MATH 1152Q, or AP credit for MATH 1131Q and 1132Q, or instructor consent. Not open to students who have passed MATH 2110Q or 2143Q. May not be taken out of sequence after passing MATH 2720, 3160, 3330, 3370, 3412, 3510, 3610.
Grading Basis: Honors Credit
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202130Q)

MATH 2141Q. Advanced Calculus I. (4 Credits)
A rigorous treatment of the mathematics underlying the main results of one-variable calculus. Intended for students with strong interest and ability in mathematics who are already familiar with the computational aspects of basic calculus. May be used in place of MATH 1131Q or 1151Q to fulfill any requirement satisfied by MATH 1131Q or 1151Q. A year of calculus (may include calculus taken in high school). May not be taken out of sequence after passing MATH 2142.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202141Q)

MATH 2142Q. Advanced Calculus II. (4 Credits)
A continuation of the rigorous treatment of the mathematics underlying the main results of one variable calculus. Basic properties of vectors and vector valued functions. May be used in place of MATH 1132Q, 1152Q or 2710 to fulfill any requirement satisfied by MATH 1132Q, 1152Q or 2710. MATH 2141Q. May not be taken out of sequence after passing MATH 2110Q, 2130Q, 2143Q, 2210Q, 2410Q, or 2420Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202142Q)

MATH 2143Q. Advanced Calculus III. (4 Credits)
A rigorous treatment of advanced topics in calculus including vector spaces and their applications in multivariable calculus. May be used in place of MATH 2110Q to fulfill any requirement satisfied by MATH 2110Q. MATH 2142Q. May not be taken for credit after passing MATH 2110Q, 2130Q, 2144Q, 2210Q, 2410Q, or 2420Q.
Grading Basis: Honors Credit
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202143Q)

MATH 2144Q. Advanced Calculus IV. (4 Credits)
The continuation of the rigorous treatment of advanced topics in multivariable calculus, vector spaces and systems of differential equations. May be used in place of MATH 2210Q or 2410Q to fulfill any requirement satisfied by MATH 2210Q or 2410Q.
MATH 2143Q. May not be taken for credit after passing MATH 2110Q, 2130Q, 2210Q, 2410Q, or 2420Q.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202144Q)

MATH 2210Q. Applied Linear Algebra. (3 Credits)
Systems of equations, matrices, determinants, linear transformations on vector spaces, characteristic values and vectors, from a computational point of view. The course is an introduction to the techniques of linear algebra with elementary applications.
MATH 1132Q or 1152Q or 2142Q. Recommended preparation: a grade of C- or better in MATH 1132Q. May not be taken out of sequence after passing MATH 2144Q, 3210, 3510, or 3710. Repeat restrictions apply. See advising.uconn.edu/repeat-policy for information.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202210Q)

MATH 2360Q. Geometry. (3 Credits)
Deductive reasoning and the axiomatic method, Euclidean geometry, parallelism, hyperbolic and other non-Euclidean geometries, geometric transformations.
MATH 1126Q or 1131Q or 1151Q or 2142Q (MATH 1126Q may be taken concurrently).
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202360Q)

MATH 2410Q. Elementary Differential Equations. (3 Credits)
Introduction to ordinary differential equations and their applications, linear differential equations, systems of first order linear equations, numerical methods.
MATH 1132Q, 1152Q, or 2142Q. Recommended preparation: A grade of C- or better in MATH 1132Q; MATH 2110Q or 2130Q. Cannot be taken after MATH 2144Q, 2420Q, 2720, 3146, 3150, 3410, 3412, 3510, 3710. Repeat restrictions apply; see advising.uconn.edu/repeat-policy.
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202410Q)

MATH 2420Q. Honors Differential Equations. (3 Credits)
The subject matter of MATH 2410 in greater depth, with emphasis on the underlying mathematical concepts. MATH 2420 satisfies any requirement met by MATH 2410, and provides superior preparation for prospective mathematics, science, and engineering majors.
MATH 1152Q or instructor consent. Not open for credit to students who have passed MATH 2410Q or 2144Q. May not be taken out of sequence after passing MATH 3146, 2720, 3150, 3410, 3412, 3710.
Grading Basis: Honors Credit
Skill Codes: COMP. Quantitative Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202420Q)

MATH 2610. Introduction to Actuarial Science. (3 Credits)
An introduction to actuarial science, covering many of the topics in the first Foundations of Actuarial Practice module, Role of the Actuary, of the Society of Actuaries. Topics include: what an actuary is and does; external forces that influence actuarial work; and the framework and processes actuaries use to perform actuarial work using Microsoft Excel.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202610)

MATH 2620. Financial Mathematics I. (3 Credits)
Fundamental concepts of financial mathematics, with applications in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, duration calculation, asset/liability management, investment income, capital budgeting and valuing contingent cash flows.
MATH 1132Q or 1152Q or 2141Q. May not be taken out of sequence after passing MATH 3615, 3620, 3630, 3634, 3650, 3660. Not open for credit to students who have passed MATH 5620.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202620)

MATH 2705W. Technical Writing in Mathematics. (1 Credit)
An introduction to the communication of mathematics through formal writing.
ENGL 1007 or 1010 or 1011 or 2011, and MATH 1132Q or 2141Q; completion of or concurrent enrollment in either MATH 2110Q, 2142Q, 2210Q, or 2410Q; open only to Mathematics majors.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202705W)

MATH 2710. Transition to Advanced Mathematics. (3 Credits)
Basic concepts, principles, and techniques of mathematical proof common to higher mathematics. Logic, set theory, counting principles, mathematical induction, relations, functions. Concepts from abstract algebra and analysis. Students intending to major in mathematics should ordinarily take this course during the third or fourth semester. Students wishing to use MATH 2710 or 2710W as a prerequisite for later MATH courses need to earn a "C" or better.
MATH 1132Q or 1152Q. May not be taken for credit after passing MATH 2143. May not be taken out of sequence after passing 3150, 3210, 3230, 3240, 3260, 3270, 3330, or 3370.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202710)

MATH 2710W. Transition to Advanced Mathematics. (3 Credits)
Basic concepts, principles, and techniques of mathematical proof common to higher mathematics. Logic, set theory, counting principles, mathematical induction, relations, functions. Concepts from abstract algebra and analysis. Students intending to major in Mathematics should ordinarily take this course or Math 2710 during the third or fourth semester. Students wishing to use MATH 2710 or 2710W as a prerequisite for later MATH courses need to earn a "C" or better.
MATH 1132Q or 1152Q; ENGL 1007 or 1010 or 1011 or 2011. Open only to Mathematics majors. Not open for credit to students who have passed MATH 2143Q.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202710W)

MATH 2720. History of Mathematics. (3 Credits)
A historical study of the growth of the various fields of mathematics. This course may not be counted in any of the major groups described in the Mathematics Departmental listing.
Either (i) MATH 2110Q or 2130Q, and either 2210 or 2410Q, or (ii) 2144Q or 2420Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202720)

MATH 2720W. History of Mathematics. (3 Credits)
A historical study of the growth of the various fields of mathematics. This course may not be counted in any of the major groups described in the Mathematics Departmental listing.
Either (i) MATH 2110 or 2130, and either MATH 2210 or 2410; or (ii) MATH 2420 or 2144; ENGL 1007 or 1010 or 1011 or 2011.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202720W)

MATH 2793. Foreign Study. (1-6 Credits)
Consent of the Department Head or Undergraduate Coordinator required, normally before the student's departure. May count toward the major with consent of the Advisor and either the Department Head or Undergraduate Coordinator.
May be repeated for credit to a maximum of 15 for MATH 1793, 2793, and 3793 together.
May be repeated for a total of 15 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202793)

MATH 2794W. Mathematics Writing Seminar. (2 Credits)
Contemporary topics in mathematics.
ENGL 1007 or 1010 or 1011 or 2011; and one of the following: (1) MATH 2144Q, or (2) one of MATH 2110Q, 2130Q, 2143Q and one of MATH 2210Q, 2410Q, 2420Q.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%202794W)

MATH 3094. Undergraduate Seminar. (3 Credits)
May be repeated for credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203094)

MATH 3146. Introduction to Complex Variables. (3 Credits)
Functions of a complex variable, integration in the complex plane, conformal mappings.
MATH 2110Q and 2410Q, or MATH 2420Q or 2144Q. Not open for credit to students who have passed MATH 5046.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203146)

MATH 3150. Analysis I. (3 Credits)
Introduction to the theory of functions of one real variable.
MATH 2144 or 2410 or 2420; MATH 2110 or 2130 or 2143; and a grade of C or better in either MATH 2142 or 2710.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203150)

MATH 3151. Analysis II. (3 Credits)
Introduction to the theory of functions of several real variables.
MATH 3150 or 4110.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203151)

MATH 3160. Probability. (3 Credits)
Introduction to the theory of probability. Sets and counting, probability axioms, conditional probabilities, random variables, limit theorems.
MATH 2110Q or 2130Q or 2143Q. Cannot be taken for credit after passing MATH 3165, 3610, 3621, 3634, 4735.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203160)

MATH 3165. Honors Probability. (3 Credits)
The subject matter of MATH 3160 in greater depth, with emphasis on the underlying mathematical concepts. May be used in place of MATH 3160 to satisfy any requirement satisfied by MATH 3160.
MATH 2130Q or 2143Q. Not open to students who have passed MATH 3160.
Grading Basis: Honors Credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203165)

MATH 3170. Elementary Stochastic Processes. (3 Credits)
(Also offered as STAT 3965.) Conditional distributions, discrete and continuous time Markov chains, limit theorems for Markov chains, random walks, Poisson processes, compound and marked Poisson processes, and Brownian motion. Selected applications from actuarial science, biology, engineering, or finance.
STAT 3345Q or 3375Q or MATH 3160.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203170)

MATH 3180. Mathematics for Machine Learning. (3 Credits)
Applications of elementary linear algebra, probability theory, and multivariate calculus to fundamental algorithms in machine learning. Topics include the theory of orthogonal projection, bilinear forms, and the spectral theorem to multivariate regression and principal component analysis; optimization algorithms such as gradient descent and Newton's method applied to logistic regression; and convex geometry applied to support vector machines. Other topics include Bayesian probability theory and the theory of convolution especially as applied to neural networks. Theory illustrated with computer laboratory exercises.
MATH 2110Q and 2210Q. Recommended preparation: MATH 3160.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203180)

MATH 3210. Abstract Linear Algebra. (3 Credits)
Vector spaces and linear transformations over fields.
MATH 2210Q or 2144Q; a grade of C or better in MATH 2142Q or 2710.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203210)

MATH 3230. Abstract Algebra I. (3 Credits)
The fundamental topics of modern algebra including elementary number theory, groups, rings, polynomials and fields.
A grade of C or better in MATH 2710 or 2142Q. Recommended preparation: MATH 2144Q or 2210Q. Cannot be taken after passing MATH 3231.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203230)

MATH 3231. Abstract Algebra II. (3 Credits)
Topics from ring theory, Galois theory, linear and multilinear algebra, or algebraic geometry.
MATH 3230. Recommended preparation: MATH 3210.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203231)

MATH 3240. Introduction to Number Theory. (3 Credits)
Euclid's algorithm, modular arithmetic, Diophantine equations, analogies between integers and polynomials, and quadratic reciprocity, with emphasis on developing both conjectures and their proofs.
A grade of C or better in MATH 2142Q or 2710.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203240)

MATH 3250. Combinatorics. (3 Credits)
Analysis of combinatorial problems and solution methods. Topics include: Enumeration, generating functions, bijective proofs, sieve methods, recurrence relations, graphs, partially ordered sets, and extremal combinatorics.
A grade of C or better in MATH 2142Q or 2710.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203250)

MATH 3260. Introduction to Mathematical Logic. (3 Credits)
Formalization of mathematical theories, elementary model theory with applications to algebra, number theory, and non-standard analysis. Additional topics: Elementary recursion theory and axiomatic set theory. Emphasis on the applications of logic to mathematics rather than the philosophical foundations of logic.
A grade of C or better in MATH 2142Q or 2710. Recommended preparation: PHIL 2211Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203260)

MATH 3265. Applied Mathematical Logic. (3 Credits)
Applied logic selected from set theory, computability theory, nonclassical logic, and type theory. Topics may include ordinal and cardinal numbers, transfinite recursion, the ZFC axioms, models of computation, undecidable problems, modal logic, intuitionistic logic.
MATH 2142Q, or a grade of C or better in MATH 2710, or CSE 2500, or PHIL 2211Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203265)

MATH 3330. Elements of Topology. (3 Credits)
Metric spaces, topological spaces and functions, topological properties, surfaces, elementary topics in geometric topology.
MATH 2110Q or 2130Q or 2143Q; and a grade of C or better in either MATH 2142Q or 2710.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203330)

MATH 3370. Differential Geometry. (3 Credits)
The in-depth study of curves and surfaces in space.
A grade of C or better in either MATH 2142Q or 2710 and either (i) MATH 2110Q or 2130Q, and MATH 2410Q or 2420Q; or (ii) MATH 2144Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203370)

MATH 3410. Differential Equations for Applications. (3 Credits)
Series solutions of differential equations, Bessel functions, Fourier series, partial differential equations and boundary value problems, nonlinear differential equations.
MATH 2110Q and 2410Q, or MATH 2144Q or 2420Q. Not open for credit to students who have passed MATH 3412. May not be taken out of sequence after passing MATH 3430.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203410)

MATH 3435. Partial Differential Equations. (3 Credits)
Solution of first and second order partial differential equations with applications to engineering and the sciences.
MATH 2110Q and one of MATH 2410Q or 2420Q or 2144Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203435)

MATH 3510. Numerical Analysis I. (3 Credits)
Analysis of numerical methods associated with linear systems, eigenvalues, inverses of matrices, zeros of non-linear functions and polynomials. Roundoff error and computational speed.
Either (i) MATH 2110Q or 2130Q, and MATH 2410Q, and MATH 2210Q or 3210; or (ii) MATH 2144Q; knowledge of at least one programming language. May not be taken out of sequence after passing MATH 3511.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203510)

MATH 3511. Numerical Analysis II. (3 Credits)
Approximate integration, difference equations, solution of ordinary and partial differential equations.
MATH 3510.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203511)

MATH 3545. Actuarial Case Studies using SAS. (1 Credit)
Design, development, testing, and implementation of solutions to problems in actuarial science using SAS.
MATH 2620, MATH 3160, STAT 3375Q, and consent of instructor.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203545)

MATH 3550. Programming for Actuaries. (3 Credits)
Design, development, testing and implementation of programs to solve actuarial problems using software such as Microsoft Office Excel with Visual Basic.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203550)

MATH 3610. Probability Problems. (1 Credit)
Preparation through problem solving for the probability actuarial examination, which tests a student's knowledge of the fundamental probability tools for quantitatively assessing risk. Recommended prior knowledge: a thorough command of probability, as well as basic concepts in insurance and risk management.
MATH 2110Q or 2130Q or 2143Q; MATH 3160.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203610)

MATH 3615. Financial Mathematics Problems. (1 Credit)
Preparation for the financial mathematics actuarial examination, which tests a student's knowledge of the theory of interest and financial economics at an introductory level.
MATH 2620.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203615)

MATH 3620. Foundations of Actuarial Science. (3 Credits)
The foundations of actuarial science, the role of the actuary, external forces that influence actuarial work, and the framework and processes used in actuarial work.
MATH 2620. Not open for credit to students who have passed MATH 2610 or FNCE 3221 or HCMI 3221. Repeat restrictions apply; see advising.uconn.edu/repeat-policy for details.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203620)

MATH 3621. Actuarial Statistics. (3 Credits)
Regression and time series applied to actuarial science. Covers the learning objectives established by the Society of Actuaries for Validation by Educational Experience in Applied Statistics.
MATH 3160; STAT 3375Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203621)

MATH 3630. Long-Term Actuarial Mathematics I. (4 Credits)
Mathematical foundations of life contingencies and their applications to quantifying risks in other actuarial contexts. Topics include long-term insurance products, survival and longevity models, life tables, life insurance, life annuities, premium calculations, reserves.
MATH 3160 or 3165 or STAT 3375Q; MATH 2620. Cannot be taken for credit after passing MATH 3631 or 5630.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203630)

MATH 3631. Long-Term Actuarial Mathematics II. (3 Credits)
Topics include multiple state models, multiple decrements, multiple lives, profit and loss analysis, pension plans and funding, retirement benefits, long-term health and disability.
MATH 3630. Not open to students who have passed MATH 5631.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203631)

MATH 3632. Loss Models. (3 Credits)
Topics from the fourth actuarial exam relating to survival, severity, frequency and aggregate models, and the use of statistical methods to estimate parameters of such models given sample data.
MATH 3630, which may be taken concurrently.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203632)

MATH 3634. Actuarial Models. (3 Credits)
Introduction to the design of computerized simulations for analyzing and interpreting actuarial and financial problems. This course, together with MATH 5637, MATH 5640, and MATH 5641, helps the student prepare for the actuarial examination on the construction and evaluation of risk models.
MATH 3160 or STAT 3025Q or 3375Q; MATH 2620.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203634)

MATH 3636. Actuarial Statistical Modeling I. (3 Credits)
Introduction to linear regression models, generalized linear models, and time series models. Case studies are used to demonstrate applications.
MATH 3160 or 3165; Math 3550; STAT 3375Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203636)

MATH 3637. Actuarial Statistical Modeling II. (3 Credits)
Introduction to principal component analysis, decision tree models, and cluster analysis. Case studies are used to demonstrate applications.
MATH 3621 or 3636.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203637)

MATH 3639. Actuarial Loss Models. (3 Credits)
Loss distribution models for claim frequency and severity, aggregate risk models, coverage modifications, risk measures, construction and selection of parametric models, introduction to simulation.
MATH 2610 or 3620; and MATH 3160 or 3165 or STAT 3375Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203639)

MATH 3640. Short-Term Insurance Ratemaking. (3 Credits)
Credibility theory, pricing for short-term insurance coverages, reinsurance, experience rating, risk classification, introduction to Bayesian statistics.
MATH 3620. Not open to students who have passed MATH 5640.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203640)

MATH 3641. Short-Term Insurance Reserving. (3 Credits)
Techniques and underlying statistical theory for estimating unpaid claims, use of claims triangles, basic adjustments to data and estimation techniques to account for internal and external environments, estimating recoveries, model adequacy and reasonableness.
MATH 3620. Not open to students who have passed MATH 5641.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203641)

MATH 3650. Financial Mathematics II. (3 Credits)
The continuation of MATH 2620. Measurement of financial risk, the mathematics of capital budgeting, mathematical analysis of financial decisions and capital structure, and option pricing theory.
MATH 2620; ACCT 2001, which may be taken concurrently. Cannot be taken for credit after passing MATH 5621. Repeat restrictions apply- see www.advising.uconn.edu/repeat-policy.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203650)

MATH 3660. Advanced Financial Mathematics. (3 Credits)
Advanced topics in financial mathematics such as single period, multi-period and continuous time financial models; Black-Scholes formula; interest rate models; and immunization theory.
MATH 2620 and 3160.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203660)

MATH 3670W. Technical Writing for Actuaries. (3 Credits)
Students will write a technical report on an advanced topic in actuarial science.
ENGL 1007 or 1010 or 1011.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203670W)

MATH 3710. Introduction to Mathematical Modeling. (3 Credits)
Theoretical and numerical analysis, using concepts from calculus, differential equations, linear algebra and discrete mathematics, applied to derive and analyze various mathematical models used in other disciplines.
MATH 2144Q or MATH 2420Q; or MATH 2210Q and MATH 2410Q.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203710)

MATH 3710W. Introduction to Mathematical Modeling. (3 Credits)
Theoretical and numerical analysis, using concepts from calculus, differential equations, linear algebra and discrete mathematics, applied to derive and analyze various mathematical models used in other disciplines.
MATH 2144Q or 2420Q; or MATH 2210Q and 2410Q; ENGL 1007 or 1010 or 1011 or 2011; open only to Mathematics majors.
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203710W)

MATH 3790. Field Study Internship. (1-3 Credits)
Consent of the Department Head, Director of the Actuarial Program, or the Undergraduate Coordinator required. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory.) Completion of freshmen - sophomore level requisite courses in the major.
May be repeated for a total of 6 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203790)

MATH 3793. Foreign Study. (1-15 Credits)
May be repeated for credit (to a maximum of 15 for MATH 1793 and 3793 together). Consent of the Department Head or Undergraduate Coordinator required, normally before the student's departure. May count toward the major with consent of the Advisor and either the Department Head or Undergraduate Coordinator.
May be repeated for credit to a maximum of 15 for MATH 1793, 2793, and 3793 together.
May be repeated for a total of 15 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203793)

MATH 3794. Problem Seminar. (1 Credit)
Problem sequences selected from algebra, geometry, calculus, combinatorics, and other branches of mathematics, designed to introduce mathematical concepts and to give experience in problem solving.
MATH 1122Q or 1132Q or 1152Q.
May be repeated for credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203794)

MATH 3795. Special Topics. (1-6 Credits)
Prerequisites and recommended preparation vary.
May be repeated for credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203795)

MATH 3796W. Senior Thesis in Mathematics. (3 Credits)
The student should define a general subject area for the thesis before choosing a thesis advisor and seeking consent at the time of registration. The student should submit a written proposal for the senior thesis to the advisor by the end of the semester preceding enrollment for thesis credit. ENGL 1007 or 1010 or 1011 or 2011; open only to Honors students.
Grading Basis: Honors Credit
Skill Codes: COMP. Writing Competency
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203796W)

MATH 3798. Variable Topics. (3 Credits)
Prerequisites and recommended preparation vary.
May be repeated for credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203798)

MATH 3799. Independent Study. (1-6 Credits)
May be repeated for credit
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203799)

MATH 3899. Independent Study. (1-3 Credits)
Credits and hours by arrangement. Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory). Instructor consent.
May be repeated for a total of 6 credits
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%203899)

MATH 4110. Introduction to Modern Analysis. (3 Credits)
Metric spaces, sequences and series, continuity, differentiation, the Riemann-Stieltjes integral, functions of several variables.
Not open for credit to students who have passed MATH 5510.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%204110)

MATH 4210. Advanced Abstract Algebra. (3 Credits)
Group theory, ring theory and modules, and universal mapping properties.
Not open for credit to students who have passed MATH 5210.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%204210)

MATH 4310. Introduction to Geometry and Topology. (3 Credits)
Topological spaces, connectedness, compactness, separation axioms, Tychonoff theorem, compact-open topology, fundamental group, covering spaces, simplicial complexes, differentiable manifolds, homology theory and the De Rham theory, intrinsic Riemannian geometry of surfaces.
Not open for credit to students who have passed MATH 5310.
View Classes (https://catalog.uconn.edu/course-search/?details&code=MATH%204310)