

MATHEMATICS (MATH)

MATH 0001. Math Intervention. 0 Hours.

NCBO Math Intervention. By department approval only.

MATH 0112. Intermediate Algebra (NCBO1). 1 Hour.

This course is an accelerated introduction to the concepts of relations and functions, inequalities, algebraic expressions, and equations. Particular attention is given to absolute value, polynomial, rational, and radical expressions. Special emphasis will be given to linear and quadratic expressions and equations. Credit in this course may not be applied toward graduation or classification of students by hours completed.

Prerequisite: A score within 5 points of the minimum passing score on the TSI Assessment Test.

MATH 0212. Intermediate Algebra (NCBO2). 2 Hours.

This course continues an examination of the concepts of relations and functions, inequalities, algebraic expressions, and equations. Particular attention is given to absolute value, polynomial, rational, and radical expressions. Special emphasis will be given to linear and quadratic expressions and equations. Credit in this course may not be applied toward graduation or classification of students by hours completed.

Prerequisite: A score within 5 points of the minimum passing score on the TSI Assessment Test.

MATH 0331. Developmental Mathematics. 3 Hours.

This course deals with fundamental operations involving whole numbers, fractions, decimals and percents, ratio and proportion, interpretation of graphs, geometry, and introductory algebra including axioms and properties of the real number system, fundamental operations involving algebraic expressions, first and second degree equations and inequalities in one unknown. Credit in this course may not be applied toward graduation or classification of students by hours completed.

MATH 0332. Intermediate Algebra. 3 Hours.

This course covers products and factoring of polynomials, algebraic fractions, exponents and radicals, quadratic equations, functions and graphs, applications and systems of equations. Credit in this course may not be applied toward graduation or classification of students by hours completed.

MATH 0333. Developmental Mathematics NCBO. 3 Hours.

Students in this course accelerate through the developmental mathematics sequence at Sam Houston State University in one term using innovative learning techniques and individualized programming. Topics include arithmetic operations, basic algebraic concepts and notation, geometry, and real and complex number systems, as well as study of relations and functions, inequalities, algebraic expressions and equations, with a special emphasis on linear and quadratic expressions and equations. This course is required for students who have not met readiness standards for math. Credit in this course will not be allowed to count toward graduation or computation of grade point average or classification of students by hours completed. (Course does not fulfill University degree requirements.)

MATH 1314. Pre Calculus Algebra. 3 Hours.

Topics include a brief review of introductory algebra, variation, elementary theory of equations, functions (including exponential and logarithmic), inequalities, systems of equations, and other related topics.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1316. Plane Trigonometry. 3 Hours.

Topics include coordinate systems, circular functions, solutions of triangles, identities, trigonometric equations, and inverse functions.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1324. Mth For Mngl Decision Making. 3 Hours.

Topics include a review of introductory algebra, equations, relations, functions, graphs, linear programming, systems of equations and matrices, and mathematics of finance.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1332. College Mathematics. 3 Hours.

This course is designed to meet the objectives of Component area 2 of the core curriculum for non-business and non-science related majors.

Topics may include sets, counting principles, probability, logic, linear algebra, linear programming, mathematics of finance, geometry, and calculus. Applications are emphasized.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1369. Elementary Statistics. 3 Hours.

This is a survey course in elementary statistics designed to acquaint students with the role of statistics in society. Coverage includes graphical descriptive methods, measures of central tendency and variation, the basic concepts of statistical inference, the notion of estimators, confidence intervals, and tests of hypotheses. Also offered as STAT 1369.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1370. Intro to Biomedical Statistics. 3 Hours.

Specifically suited to those seeking entrance into the Nursing profession, this elementary statistics course is designed to foster critical thinking about data. Coverage includes graphical and numerical descriptive methods; measures of central tendency and variation; the basic concepts of statistical inference; the notion of estimators, confidence intervals and tests of hypotheses. Data will be analyzed with the help of software currently used in the profession, such as SPSS and/or Minitab. Also offered as STAT 1370.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1384. Intro To Foundations Of Math I. 3 Hours.

Topics include a study of sets, systems of numeration, natural numbers, integers, number theory and rational numbers. Credit in this course is applicable only toward elementary/middle school certification.

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1385. Intro Foundations Of Math II. 3 Hours.

Topics include basic notions of Euclidean Geometry in 2 and 3 dimensions, ratio, proportions, percents, decimals, concepts of congruence and similarity, transformational geometry and measurement. Credit in this course is applicable only toward elementary/middle school certification.

Prerequisite: MATH 1384 with a grade of C or better.

MATH 1410. Elementary Functions. 4 Hours.

Elementary Functions and their applications, including topics from algebra, trigonometry and analytic geometry, are used to assist in the algebraic and graphical description of the following elementary functions: polynomial, rational, exponential, logarithmic, and trigonometric functions. This course is for students intending to take calculus (MATH 1420).

Prerequisite: Passing score on the MATH TSI Assessment or equivalent.

MATH 1420. Calculus I. 4 Hours.

Topics include limits and continuity, the derivative, techniques for differentiation of algebraic, logarithmic, exponential and trigonometric functions, applications of the derivative and anti-differentiation, definite integral, Fundamental Theorem of Calculus.

Prerequisite: C or better in MATH 1410 or MATH 1314 and MATH 1316 with a grade of C or higher; or high school equivalent.

MATH 1430. Calculus II. 4 Hours.

Topics include the definite integral and its applications, techniques of integration, improper integrals, Taylor's formula and infinite series.

Prerequisite: MATH 1420 with a grade of C or better.

MATH 2384. Functions And Graphs. 3 Hours.

The emphasis of this course is on functions and their multiple representations including linear, polynomial, logarithmic, exponential and logistic functions. This course may be applied only toward middle school teacher certification. Normally offered in the Fall, Spring, and Summer.

Prerequisite: MATH 1385 with grade of C or better.

MATH 2385. Fundamentals Of Calculus. 3 Hours.

This course provides an introduction to the concepts and applications of calculus. This course may be applied only toward middle school teacher certification. Normally offered in the Fall, Spring, and Summer.

Prerequisite: C or better in MATH 2384.

MATH 2395. Discrete Mathematics. 3 Hours.

This is an applied course in discrete mathematical structures. Topics may include sets, logic, mathematical proof, computational complexity, relations, graphs, trees, boolean algebra, number theory, combinatorics, probability, recurrence relations, and finite state machines. This course is designed for computer science majors, so programming applications will be emphasized.

Prerequisite: MATH 1420 and COSC 1436 with a grade of C or better.

MATH 2399. Mth For Mngl Decision Making. 3 Hours.

Topics include differential and integral calculus with applications in areas such as business and economics.

Prerequisite: MATH 1324 or MATH 1314.

MATH 2440. Calculus III. 4 Hours.

This course includes the study of the calculus of functions of several variables and topics in vector calculus including line and surface integrals, Green's Theorem, Divergence Theorem, and Stoke's Theorem.

Prerequisite: MATH 1430 with a grade of C or better.

MATH 3300. Introduction To Math Thought. 3 Hours.

This course includes an introduction to sets, logic, the axiomatic method and proof. Normally offered in the Spring and Summer I. Normally offered in the Spring and Summer I.

Prerequisite: Grade of C or better in MATH 1430 or consent of instructor.

MATH 3350. Theory of Interest. 3 Hours.

This course will derive the mathematical principles of such financial instruments as amount functions, interest rates and yields, force of interest, special annuity types, bonds, yield curves, and interest rate sensitivity. Also included will be a discussion of the mathematics of financial derivatives. This course covers the content on which the joint Society of Actuaries/Casualty Actuarial Society Exam FM/2 on mathematical interest theory is based.

Prerequisite: Grade of C or better in Math 1430.

MATH 3363. Euclidean Geometry. 3 Hours.

This course consists of a modern development of Euclidean geometry and a limited introduction to non-Euclidean geometry. Normally offered in Fall and Summer II. Normally offered in Fall and Summer II.

Prerequisite: MATH 3300 or consent of instructor.

MATH 3376. Differential Equations. 3 Hours.

This course, in conjunction with MATH 4376, is intended to develop a basic competence in areas of mathematics that are used in solving problems from the physical sciences. This first course emphasizes the general solution of ordinary differential equations, including the Laplace transform and infinite series methods. Normally offered in the Fall. Normally offered in the Fall.

Prerequisite: Grade if C or better in MATH 2440 or concurrent enrollment.

MATH 3377. Intro To Linear Alg & Matrics. 3 Hours.

Topics include: solving systems of linear equations, fundamental matrix theory (invertibility theorems, determinants), eigenvectors, and properties of linear transformations. Remaining topics are chosen from: Properties of general vector spaces, inner product spaces, and/or diagonalization of symmetric matrices. Normally offered in the Spring and Summer II. Normally offered in the Spring and Summer II.

Prerequisite: Grade of C or better in MATH 1430.

MATH 3379. Statistical Mthods In Practice. 3 Hours.

Topics include organization and presentation of data, measures of central tendency, dispersion, and position, probability distributions for discrete and continuous random variables, sampling techniques, parameter estimation, and hypothesis testing. Emphasis will be given to the use of statistics packages. Normally offered in the Fall, Spring, Summer I. Also offered as STAT 3379.

Prerequisite: Three (3) semester hours of college mathematics.

MATH 3380. Historical Perspec of Math. 3 Hours.

(SH Prior Course ID: MTH 380); This course is designed to present mathematical topics from a historical perspective. The number systems and computational methods of past cultures and civilizations are discussed, along with the development of number theory and trigonometry. Credit in this course is applicable only toward elementary/middle school teacher certification. Normally offered in the Fall and Spring.

Prerequisite: C or better in MATH 2384.

MATH 3381. Intro - Foundation Of Math III. 3 Hours.

Topics include proportions, percents, probability, data analysis, algebraic reasoning, and problem solving. Credit in this course is applicable only toward elementary/middle school certification. Normally offered in the Fall, Spring, and Summer. Normally offered in the Fall, Spring and Summer.

Prerequisite: C or better in MATH 1385.

MATH 3382. Foundations Of Middle Sch Math. 3 Hours.

Topics include relations, functions, coordinate geometry, logic, and history of mathematics. Credit in this course is applicable only toward middle school certification. Normally offered in the Fall and Spring. Normally offered in the Fall and Spring.

Prerequisite: C or better in MATH 2384.

MATH 3383. Geometric Meas./Transformation. 3 Hours.

Topics included in this course are measurement in one, two, and three dimensions, the metric system, transformational geometry, congruencies, similarities, geometric constructions, and coordinate systems. This course may be applied only toward middle school certification. Normally offered in the Fall and Spring of each year and in the Summer of odd numbered years.

Prerequisite: C or better in MATH 2385.

MATH 3384. Foundations Of Mathematics. 3 Hours.

This course includes an introduction to logic, concepts of proof, proof techniques, induction, and sets. It may be applied only toward middle school certification. Normally offered in the Fall and Spring and in the Summer of even numbered years.

Prerequisite: C or better in MATH 2385 or equivalent.

MATH 3386. Fundmtls Probability/Stats. 3 Hours.

This course provides an introduction to probability, descriptive statistics, and inferential statistics, including regression, confidence intervals, and the construction and interpretation of tables, graphs, and charts. Technology related to the above topics will be incorporated into the course. This course may be applied only toward middle school certification. Normally offered in the Fall and Spring and in the Summer of even numbered years.

Prerequisite: C or better in MATH 2385.

MATH 3387. Problem Solving-Middle Sch Mth. 3 Hours.

Topics included in this course are problem-solving strategies appropriate for middle school or junior high mathematics. The course may be applied only toward middle school certification. Normally offered in the Fall and Spring of each year and in the Summer of odd numbered years.

Prerequisite: C or better in Math 2385.

MATH 3394. Numerical Methods. 3 Hours.

Topics include interpolation, approximations, solutions of equations, and the solution of both linear and nonlinear systems of equations. Also offered as COSC 3394. Normally offered in the Spring. Normally offered in the Spring.

Prerequisite: COSC 1436 and MATH 1430 with a grade of C or higher.

MATH 3396. Operations Research I. 3 Hours.

Techniques for the application of the scientific method to decision making in business and government are presented through the formulation and interpretation of mathematical models for various specific real life problems. Normally offered in the Fall.

Prerequisite: MATH 1430 with a grade of C or higher.

MATH 4090. Independent Study. 1-3 Hours.

This course is designed for advanced students to engage in independent study of an area of interest in mathematics under the close guidance of a faculty mentor. Variable credit (1 to 3).

Prerequisite: Consent of instructor.

MATH 4361. Introductory Analysis. 3 Hours.

This course consists of a more thorough treatment of the material traditionally considered in elementary calculus. Topics include sets, functions, properties of the real number system and sequences. Writing enhanced. Normally offered in the Fall. Normally offered in the Fall.

Prerequisite: C or better in MATH 3300 or consent of the instructor.

MATH 4366. Elementary Analysis. 3 Hours.

Topics include limits, continuity, differentiation, Riemann integration, infinite series and sequences and series of functions. Normally offered in the Spring. Normally offered in the Spring.

Prerequisite: MATH 4361 with a grade of C or better.

MATH 4367. The Evolution Of Mathematics. 3 Hours.

Normally offered in Spring. An introduction to the historical development of fundamental mathematical ideas from antiquity to the present.

Prerequisite: Grade of C or better in MATH 1430.

MATH 4370. Special Topics In Mathematics. 3 Hours.

Normally, this course consists of readings and individual research appropriate for the undergraduate level with subject matter for study selected by mutual agreement of student and supervisor. However, special classes may be organized when there is sufficient student interest in a particular project. Writing enhanced. This course may be taken for Academic Distinction Credit. See Academic Distinction Program in this catalog.

Prerequisite: Six (6) semester hours of advanced college math and instructor consent.

MATH 4371. Thry & Appl Of Prob & Stat I. 3 Hours.

Topics include basic concepts and properties of probability, random variables, statistical distributions, measures of central tendency, variance, covariance, correlation, functions of random variables, sampling distributions, and the Central Limit Theorem. Also offered as STAT 4371. Normally offered in the Fall. Normally offered in the Fall.

Prerequisite: MATH 1430.

MATH 4372. Thry & Appl-Probability & Stat. 3 Hours.

Topics include multivariate, conditional and marginal distributions, point and interval estimation, theory of estimation, maximum likelihood estimates, hypothesis testing, likelihood ratio tests, contingency analysis, and nonparametric statistics. Also offered as STAT 4372. Normally offered in the Spring. Normally offered in the Spring.

Prerequisite: MATH 2440 and STAT 4371.

MATH 4376. Topics In Applied Mathematics I. 3 Hours.

This course, in conjunction with MATH 3376, is intended to develop a basic competence in areas of mathematics that are used in solving problems from the physical sciences. Topics will be selected from partial differential equations, multivariable and vector calculus, and complex analysis. Normally offered in the Spring. Normally offered in the Spring.

Prerequisite: MATH 3376 or consent of the instructor.

MATH 4377. Algebraic Structures. 3 Hours.

Topics include groups, rings, fields, finite groups and Abelian groups. Normally offered in the Fall.

Prerequisite: C or better in MATH 3300 and MATH 3377.

MATH 4384. Survey Of Mathematical Ideas. 3 Hours.

This course is designed to bring together and supplement the technical material of other mathematics courses in the mathematics teacher-education program and relate it to the mathematics curriculum of the secondary school. This course may be applied only toward teacher certification. Normally offered in the Spring. Normally offered in the Spring.

Prerequisite: Grade of C or better in MATH 3300; Advanced standing in mathematics.

MATH 4385. Mathematical Problem Solving. 3 Hours.

This course focuses on solving mathematical problems including the use of proof as well as graphical and numerical methods. It extends and connects concepts from algebra, geometry, and calculus, including functions, graphs, complex numbers and number systems. This course may be applied only toward teacher certification. Normally offered in the Fall. Normally offered in the Fall.

Prerequisite: Grade of C or better in MATH 3300; Advanced standing in mathematics.

MATH 4395. Undergraduate Research. 3 Hours.

This course consists of special projects or topics in theoretical or applied mathematics. Each student pursues an approved project of interest guided by a mathematics faculty member. Each student is expected to demonstrate individual initiative in planning and conducting the research program or topic. This course may be taken for Academic Distinction credit.

Prerequisite: C or better in MATH 3300 and department approval.