MATHEMATICS (MAT)

MAT 095: Fundamental of Mathematics
Required of all students whose placement data do not warrant enrollment in MAT 096 or above. Arithmetic and properties of real numbers, ratio and proportion, introduction to statistics and algebra. (Does not count toward any degree requirements.)
Credit Hours: 3
Contact Hours: 3

MAT 096: Beginning Algebra
Required of all students whose placement data do not warrant enrollment in MAT 097 or above. Beginning algebra including linear and quadric equations, polynomials, rational. Expressions, radical and graphing. (Does not count toward any degree requirements.)
Prerequisite: MAT 095 or appropriate score on placement test
Credit Hours: 3
Contact Hours: 3

MAT 097: Intermediate Level Algebra
Linear equations and inequalities, systems of linear equations, polynomials and polynomial functions, quadratic equations, rational expressions, radicals, and rational exponents. (Does not count toward any degree requirements.)
Prerequisite: MAT 096 or appropriate score on placement test
Credit Hours: 3
Contact Hours: 3

MAT 101: Algebraic Concepts
This course develops algebraic skills through the use of data collection, hands-on manipulatives, and application of algebraic concepts with embedded study skills. Topics include the properties of equality; linear equalities and inequalities, with applications; graphing(linear, quadratic and exponential growth models), including data collection; rigorous quantitative and qualitative analysis of quadratic functions; and appropriate applications. This course serves as a prerequisite for studentswhose intended major requires them to complete MAT 115A. Students will attend a total of four hours of laboratory and one hour of lecture per week taught by mathematics faculty and mathematics instructional counselors CREDIT:THREE SEMESTER HOURS.
Prerequisite: Math ACT/SAT sub-score of 15-18/350-450
Credit Hours: 3
Contact Hours: 3

MAT 111: Acceler. Contemp. Mathematics
This course develops problem-solving and mathematical skills through a sequence of applied topics. Topics may include mathematical finance, probablilty and statistics, growth models for a variety of situations, and geometry. The prerequisite material required for each topic will be covered with the topic. Students will attend a total of four hours of lecture and laboratory per week taught by mathematics faculty and mathematics instructional counselors.
Credit Hours: 3
Contact Hours: 3

MAT 115: College Algebra
This course develops the algebraic skills necessary for further studies in matematics. topics include the algebra of functions; graphing techniques; quantitative and qualitative analysis of polynomial, rational, exponential and logarithmic functions, including limits at infinity and infinite limits; and appropriate applications. CREDIT: THREE SEMESTER HOURS
Prerequisite: Successful completion of an Intermediate Algebra course with a grade of C or higher, an ACT math sub-score of 22 (or higher), a SAT math sub-score of 510 (or higher), a KYOTE College Algebra Placement score of 14 (or higher, or a COMPASS score of 50 (or higher)
Credit Hours: 3
Contact Hours: 3

MAT 115A: Accelerated College Algebra
This course is designed to be an efficient combination of Intermediate Algebra and College Algebra. Topics include manipulation of monomials, polynomials, rational and radical expressions; solving equations and inequalities, including linear, rational, quadratic, absolute value, exponential and logarithmic; developing problem solving techniques; and introduction to functions, variation, the algebra of functions and their graphs; study of properties and graphs of polunomial, rational, exponential and logarithmic functions, including use of a graphing calculator and regression analysis; reading/interpreting graphs of function and applications. Students will attend a total of five hours of lecture and laboratory per week taught by mathematics instructional counselors. CREDIT:FOUR SEMESTER HOURS.
Prerequisite: A grade of C or better in MAT 101, and ACT math sub-score of 19(or higher), and SAT math sub-score of 460(or higher), a KYOTE College Readiness placement score of 22(or higher) or a COMPASS score of 36(or higher)
Credit Hours: 4
Contact Hours: 4

MAT 120: Precalculus
Review of polynomial, rational, exponential, and logarithmic functions, their graphs, and inverses; trigonometric identities, functions and their inverses; complex numbers; vectors; linear systems of equations, and polar coordinates.
Prerequisite: MAT 115 or MAT 176 with grade of C or higher or appropriate scores on ACT, SAT, or placement test
Credit Hours: 4
Contact Hours: 4

MAT 125: Business Calculus and Matrices
This course covers matrices, Gauss/Jordan reductions, systems of linear equations, and introduction to differential and integral calculus. A variety of business applications are included.
Prerequisite: MAT 115. or appropriate scores on ACT, SAT, or placement test
Credit Hours: 3
Contact Hours: 3

MAT 131: Calculus/Analy Geom I
Review of functions; limits of functions; derivatives and definite integrals of algebraic and transcendental functions; indeterminate forms; applications of the derivative and integral; the fundamental theorem of calculus.
Prerequisite: MAT 120 with a C or better or appropriate scores on ACT, SAT, or placement test
Credit Hours: 5
Contact Hours: 5

MAT 132: Calculus/Analy Geom II
Review of the fundamental theorem of calculus; properties of definite and indefinite integrals; applications of the definite integral; techniques of integration; improper integrals; definite integral approximation with error bounds; infinite sequences and series; Taylor polynomial approximation; parametric equations and polar coordinates.
Prerequisite: MAT 131
Credit Hours: 5
Contact Hours: 5

MAT 171: Algebraic Concepts
This is a 3-credit course consisting of three hours of regular classroom contact taught by mathematics faulty and 2 hours of supplemental math studio contact guide by ACE instructional counsellors in coordination with the faculty responsible for the course. This course develops algebraic skills through the use of data collection, hands-on manipulatives, and application of algebraic concepts with embedded study skills. Topics include the properties of equality; linear equalities and inequalities, with applications; graphing (linear, quadratic, and exponential growth models), including data collection; rigorous quantitative and qualitative analysis of quadratic functions; and appropriate applications. This course serves as a prerequisite for students whose intended major requires them to complete MAT115/176. CREDIT: 3 SEMESTER HOURS.
Prerequisite: MAT 095 with a grade of C or better or appropriate sores on ACT, SAT, ormathematics placement test
Credit Hours: 3
Contact Hours: 3

MAT 172: Accelerated Contemp. Math
This course develops problem-solving and mathematical skills through a sequence of applied topics. Topics include mathematical finance, probability and statistics, and linear and quadratic growth models. The beginning algebra required for each topic will be covered with the topic. CREDIT: 3 SEMESTER HOURS.
Prerequisite: MAT 095 with grade of C or better or appropriate scores on ACT, SAT, or mathematics placement test
Credit Hours: 4
Contact Hours: 4

MAT 176: Accelerated College Algebra
This course is designed to be an efficient combination of Intermediate Algebra and College Algebra. Topics include manipulation of monomials, polynomials, rational and radical expressions; solving equations and inequalities, including linear, rational, quadratic, absolute value, exponential logarithmic; developing problem solving techniques; and introduction to functions, variation, the algebra of functions and their graphs; study of properties and graphs of polynomial and rational functions, including use of a graphing calculator and regression analysis; reading/interpreting graphs of function and applications. CREDIT: 4 SEMESTER HOURS.
Prerequisite: An ACT math subscore of 19 (or better), or an SAT math subscore of 400 (or better), or a grade of C or better in MAT 096, or a KYOTE College Readiness placement score of 22 (or better)
Credit Hours: 4
Contact Hours: 4

MAT 200: Intro to Stat Reasoning & Ana.
MAT200 is a 4-credit hour course consisting of three hours of regular classroom contact taught by Mathematics Faculty and a 1 hour career application lab. Topics will include sampling techniques, data measurement and classification, measures of central tendency, representation and communication of statistical information symbolically, visually and numerically, probability, evaluation and assessment of different statistical models such as normal distributions, linerar regression, confidence intervals and one sample lypothesis testing.
Prerequisite: Appropriate scores on ACT, SAT, COMPASS, and KYOTE College Readiness
Credit Hours: 4
Contact Hours: 4

MAT 203: Math For Elem Teachers I
This is the first course in a two-semester sequence designed to meet the needs of elementary school teachers. Topics include sets, whole numbers, numeration systems, bases, elementary number theory, fractions, decimals, real numbers. Problem solving, applications and historical topics are discussed throughout the course.
Prerequisite: completion of mathematics liberal studies requirement
Credit Hours: 4
Contact Hours: 4

MAT 204: Math For Elem Teachers II
Continuation of MAT 203. Topics include ratio and proportion, probability, statistics, geometry, and measurement.
Prerequisite: MAT 203
Credit Hours: 4
Contact Hours: 4

MAT 231: Multivariate Calculus
Calculus of vector/valued functions, partial differentiation, multiple integrals, curl, surface integrals and Stokes' theorem. Plane curves, polar coordinates, vectors, and three/dimensional analytic geometry.
Prerequisite: MAT 132
Credit Hours: 3
Contact Hours: 3

MAT 232: Differential Equations
The study of first/order equations, linear equations, the Laplace transform, Picard's existence theorems, and systems of equations.
Prerequisite: MAT 132
Credit Hours: 3
Contact Hours: 3

MAT 300: Intro to Advanced Math
This course provides an orientation to higher mathematics. Topics include logic, mathematical proof, set theory, relations and functions, and an introduction to mathematical axiom systems.
Prerequisite: MAT 132 or consent of instructor
Credit Hours: 3
Contact Hours: 3

MAT 304: Perspective On Mathematics
Survey of history, cultural ramifications, methods, connections among various branches, and opportunities of mathematics. Required of all mathematics and applied mathematics majors
Prerequisite: MAT 131
Credit Hours: 3
Contact Hours: 3

MAT 307: Linear Algebra
Coordinates, vectors, vector spaces, subspaces, Euclidean n/space, determinants, linear trans/ formations, linear transformations and matrices, bilinear and quadratic forms are studied.
Prerequisite: MAT 132 or consent of instructor
Credit Hours: 3
Contact Hours: 3

MAT 312: Mathematical Programming
This course is an introduction to modern operations research. Modeling, theory, and applications of linear programming, integer programming, scheduling, inventory, and network problems are studied.
Prerequisite: MAT 125 or MAT 307
Credit Hours: 3
Contact Hours: 3

MAT 315: Numerical Analysis
Techniques of numerical approximation in analysis and algebra.
Prerequisite: MAT 231
Credit Hours: 3
Contact Hours: 3

MAT 321: Probability/Statistics I
Measures of central tendency and dispersion, basic probability theory, Bayes Theorem, discrete and continuous univariate probability distributions, moments, random variables, sampling theory, estimation, hypothesis testing.
Prerequisite: MAT 132
Credit Hours: 3
Contact Hours: 3

MAT 322: Probability/Statistics II
Multivariate distributions, joint and conditional distributions, moments, variance and covariance, functions of several random variables, correlation and regression, chi-square tests, analysis of variance.
Prerequisite: MAT 321
Credit Hours: 3
Contact Hours: 3

MAT 326: Modern Geometry
This course includes study of axiom systems; Euclidean and Non-Euclidean Geometries; affine, spherical, projective and vector geometries.
Prerequisite: MAT 300
Credit Hours: 3
Contact Hours: 3

MAT 333: Complex Variables
this course is focused on the techniques and applications of the complex number system. Topics include Euler formula, analytic functions, and the method of residues.
Credit Hours: 3
Contact Hours: 3

MAT 399: Undergrad Teaching Exper
Students earn course credit for undergraduate teaching experience including but not limited to (1) assisting students during laboratory sessions, (2) helping to set up laboratories or lecture/lab quizzes, or (3) conducting PLTL-Excel type workshops for students. Course may be repeated for credit.
Prerequisite: Consent of instructor
Credit Hours: 1
Contact Hours: 1

MAT 401: Modern Algebra I
Operations, permutations, groups, isomorphisms, factor groups, Sylow's theorems, and applications are discussed.
Prerequisite: MAT 300
Credit Hours: 3
Contact Hours: 3

MAT 402: Modern Algebra II
Continuation of MAT 401. Rings, integral domains, quotient rings and ideals, extension fields, and vector spaces are studied
Prerequisite: MAT 401
Credit Hours: 3
Contact Hours: 3

MAT 403: Real Analysis I
Real numbers and Euclidean n/space, continuous functions, differentiable functions of one and several variables, and the Riemann integral are studied.
Prerequisite: MAT 231 and MAT 300
Credit Hours: 3
Contact Hours: 3

MAT 404: Real Analysis II
Classical Lebesque integral, power series, curves, surfaces, integral theorem, divergence, and theorems of Green and Stokes are discussed. Some applications are examined.
Prerequisite: MAT 403
Credit Hours: 3
Contact Hours: 3

MAT 411: Topology
Topological spaces, metric spaces, separation axioms, connectedness, compactness, continuity, product and quotient spaces.
Prerequisite: MAT 300
Credit Hours: 3
Contact Hours: 3

MAT 415: Elementary Dynamical Sys
Time evolution of various physical and/or biological systems and asymptotic behavior of orbits in space are studied with various mathematical techniques.
Prerequisite: MAT 232
Credit Hours: 3
Contact Hours: 3

MAT 460: Mathematics Seminar
An integrated overview of the mathematics curriculum. Each student will be required to prepare and present independent investigation of topics of personal/professional interest. May be repeated once for credit.
Prerequisite: Senior standing in mathematics
Credit Hours: 3
Contact Hours: 3

MAT 470: Mathematical Modeling
This course is designed to provide a student with broad exposure to mathematical models and techniques to find solutions to governmental, industrial, and management problems. Optimization technique, probability and stochastic processes, physical and biological applications, hierarchies and priorities, computer-aided modeling and problem solving will be covered.
Prerequisite: Consent of instructor
Credit Hours: 3
Contact Hours: 3

MAT 495: Topics in Mathematics
This course requires intensive examination of a mathematical topic chosen by a faculty member in Mathematics. This course will involve intensive reading, presentation, and discussion, as well as writing. May be repeated for credit.
Prerequisite: Consent of instructor
Credit Hours: 3
Contact Hours: 3

MAT 497: Contemporary Topics in Math
An exploration of contemporary topics in business management. May be repeated for credit for different topics (maximum of 9 credit hours). Examples of topics include lean, green, and sigma, global competitiveness, sustainable business practice, team management, leadership or other current issues.
Credit Hours: 3
Contact Hours: 3