

MATHEMATICS (MAT)

MAT 11 (3 credit hours)

Transitional Algebra

Provides individualized, accelerated, mastery-level progression through entry-level college mathematics Pre-requisite competencies as defined by KY Council of Postsecondary Education. Note: A passing grade in this course does not necessarily indicate that all prerequisites for all entry-level college mathematics courses have been met. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: KCTCS Placement Exam.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 50 (1-2 credit hours)

Developmental Mathematics Workshop

Provides supplemental academic support such as extra class sessions, tutoring, and/or increased monitoring to promote student success. May be associated with any developmental math course offered through KCTCS and may be repeated for each math course. Credit cannot be received by special exam. Laboratory: 1-2 credits (30-60 contact hours).

Co-requisite: Set by instructor.

Attributes: Remedial - Mathematics

Components: LAB: Laboratory

MAT 55 (3 credit hours)

Pre-Algebra

Includes operations on integers, decimals and fractions. Introduces exponents, square roots, percents, ratios, proportions, prime factorization, basic geometry, algebraic expressions, basic linear equations, and applications. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: KCTCS placement examination.

Attributes: Remedial - Mathematics, Course Also Offered in Modules

Components: LEC: Lecture

MAT 55A (1.6 credit hours)

Integers, Fractions and Decimals

Covers the properties of real numbers, prime factorization of whole numbers, rounding of whole numbers, and decimals to an indicated place value. Includes basic operations, order of operations, and absolute value on integers, fractions and decimals. Permits the conversion among fractions, decimals, and percents; evaluation of whole number powers of integers, fractions, and decimals; and the evaluation of square roots of perfect squares of integers, fractions, and decimals. Lecture: 1.6 credits (24 contact hours).

Pre-requisite: KCTCS Placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 55B (0.7 credit hours)

Algebraic Expressions

Includes the evaluation of algebraic expressions, simplifying algebraic expressions, solving problems involving ratio and proportion, and solving problems involving percent. Lecture: 0.7 credits (10.5 contact hours).

Pre-requisite: MAT 55A.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 55C (0.7 credit hours)

Beginning Linear Equations

Uses both the addition and multiplication properties to solve a linear equation. Includes how to determine the length of the unknown side of a right triangle using the Pythagorean Theorem and to determine the perimeter, circumference, area, surface area, and volume of basic plane figures and solids. Covers how to solve applied problems using these competencies with real world applications. Lecture: 0.7 credits (10.5 contact hours).

Pre-requisite: MAT 55B.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 61 (4 credit hours)

Foundations of College Algebra

Prepares students to take College Algebra with College Algebra Workshop. Introduces operations on integers, decimals, and fractions; ratios, proportions, and percents; simplifying radicals and algebraic expressions; solving linear and quadratic equations; linear inequalities; solving formulas; factoring; slope and graphing lines. Lecture: 4 credits (60 contact hours).

Pre-requisite: KCTCS Placement Policy.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 62 (3 credit hours)

Intro to Workplace Mathematics

Prepares students for Business Mathematics, Applied Mathematics, and Technical Mathematics. Includes properties of algebra, using formulas, solving linear equations, percentages, ratios, proportions, plotting points, graphing lines, exponents, and measurement. Encourages applications of algebra and effective use of technology. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: MAT 55 or equivalent as determined by KCTCS placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 65 (3 credit hours)

Basic Algebra

Includes linear equations and inequalities, integer exponents, polynomials, factoring, equations of lines and their graphs, systems of linear equations, and applications. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: MAT 55 or KCTCS placement examination.

Attributes: Remedial - Mathematics, Course Also Offered in Modules

Components: LEC: Lecture

MAT 65A (0.8 credit hours)

Linear Equations and Inequalities

Includes solving linear equations in one variable, literal equations for a specified variable, and linear inequalities. Covers writing sets using interval and set-builder notations and translating verbal statements into algebraic expressions. Lecture: 0.8 credits (12 contact hours).

Pre-requisite: MAT 55 or KCTCS Placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 65B (0.5 credit hours)**Polynomials**

Includes the application of rules of integer exponents; addition, subtraction, and multiplication of polynomials of one or more variables; and division of polynomials of one variable. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: MAT 65A.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 65C (0.8 credit hours)**Lines**

Includes plotting points in the rectangular coordinate plane; graphing a linear equation in two variables using multiple methods; determining the slope of a line given the two points, a graph, or an equation; determining the intercepts of a line; and determining if two lines are parallel, perpendicular, or neither based on slope. Lecture: 0.8 credits (12 contact hours).

Pre-requisite: MAT 65B.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 65D (0.5 credit hours)**Factoring**

Includes the factoring of polynomials by finding the greatest common factor, by grouping, and by using special products. Covers factoring general trinomials and solving polynomial equations by factoring. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: MAT 65C.

Attributes: Remedial - Mathematics

Components: LAB: Laboratory

MAT 65E (0.4 credit hours)**Systems of Linear Equations**

Includes solving systems of linear equations in two variables using multiple methods and solving applied problems using these competencies with real world applications. Lecture: 0.4 credits (6.0 contact hours).

Pre-requisite: MAT 65D.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 71 (3 credit hours)**Foundations of Precalculus**

Includes linear and absolute value equations and inequalities, linear equations in two variables, polynomials and factoring, exponential and radical expressions, quadratic equations, and systems of two linear equations. Lecture: 3 credit hours (45 contact hours).

Pre-requisite: KCTCS placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 75 (4 credit hours)**Mathematical Literacy**

Develops the mathematical thinking skills and understanding needed for non-math and non-science majors, in a one-semester course integrating numeracy, proportional reasoning, algebraic reasoning, and functions. Provides an alternate path to college-level math courses other than college algebra. Lecture: 4.0 credits (60 contact hours).

Pre-requisite: MAT 55 or equivalent as determined by KCTCS placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 85 (3 credit hours)**Intermediate Algebra**

Includes rational expressions, radical expressions, rational exponents, graphing parabolas, inequalities, equations of lines, functions and applications, with emphasis on solving quadratic, rational, and radical equations. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: MAT 65 or MAT 75 or KCTCS placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 96 (1-2 credit hours)**Supplemental Mathematics**

Provides academic support for students scoring below the system-wide standard into a quantitative-reasoning course. Serves as supplemental co-requisite for students with borderline test scores, as defined in the KCTCS course placement policy. If students withdraw from MAT 96, they must also withdraw from the co-requisite course. Lecture: 1.0 - 2.0 credits (15 - 30 contact hours).

Co-requisite: A quantitative-reasoning course requiring supplemental instruction.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 100 (2 credit hours)**College Algebra Workshop**

Provides parallel and supplemental review of algebra skills needed for success in college algebra for students with a Math ACT of 19-21. (Credit not available by special exam; withdrawal from MAT 100 requires withdrawal from MAT 150; can be offered pass/fail or letter grade basis.) Lecture: 2.0 credits (30 contact hours). NOTE: Effective Fall 2010 ACT 19.

Pre-requisite: Concurrent enrollment in MAT 150.

Attributes: Other, Course Also Offered in Modules, Supplemental Mathematics

Components: LEC: Lecture

MAT 105 (3 credit hours)**Business Mathematics**

Covers basic mathematical concepts as applied to finance. Includes percentages, simple and compound interest, annuities, sinking funds, depreciation, and consumer debt, including installment buying, credit cards, and mortgages. MAT 61, MAT 62, MAT 65, MAT 71, MAT 75, or MAT 85, OR 2. Completion of MAT 55 and concurrent enrollment in MAT 105S, OR 3. KCTCS placement policy. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: 1.

Attributes: Quantitative Reasoning AAS

Components: LEC: Lecture

MAT 105S (1-2 credit hours)**Corequisite Remediation for Business Mathematics**

Provides supplementary instruction for students who do not meet college readiness standards for MAT 105. Covers content necessary for student success in MAT 105. Lecture: 1-2 credits (15-30 contact hours).

Co-requisite: MAT 105.

Attributes: Other

Components: LEC: Lecture

MAT 110 (3 credit hours)**Applied Mathematics**

Includes the concepts of ratio and proportion, units and conversions, linear equations in two variables, inequalities, graphing and writing equation of a line, percents, interest, descriptive statistics, and logical symbolism. Emphasizes applications in the various technologies. MAT 61, MAT 62, MAT 65, MAT 71, MAT 75, or MAT 85, OR 2. Completion of MAT 55 and concurrent enrollment in MAT 110S, OR 3. KCTCS placement policy. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: 1.

Attributes: Quantitative Reasoning AAS, Course Also Offered in Modules

Components: LEC: Lecture

MAT 110S (1-2 credit hours)**Corequisite Remediation for Applied Mathematics**

Provides supplementary instruction for students who do not meet college readiness standards in MAT 110. Covers content necessary for student success in MAT 110. Lecture: 1-2 credits (15-30 contact hours).

Co-requisite: MAT 110.

Attributes: Other

Components: LEC: Lecture

MAT 116 (3 credit hours)**Technical Mathematics**

Includes some mathematical concepts from algebra, geometry, and trigonometry and applications relevant to these topics. Includes unit conversions, variation, measurement of geometric figures, vectors, and solving right and oblique triangles using trigonometry. Emphasizes applications in the various technologies. MAT 61, MAT 62, MAT 65, MAT 71, MAT 75, or MAT 85, OR 2. Completion of MAT 55 and concurrent enrollment in MAT 116S, OR 3. KCTCS placement policy. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: 1.

Attributes: Quantitative Reasoning AAS, Course Also Offered in Modules

Components: LEC: Lecture

MAT 116S (1-2 credit hours)**Corequisite Remediation for Technical Mathematics**

Provides supplementary instruction for students who do not meet college readiness standards for MAT 116. Covers content necessary for student success in MAT 116. Lecture: 1-2 credit hours (15-30 contact hours).

Co-requisite: MAT 116.

Attributes: Other

Components: LEC: Lecture

MAT 126 (3 credit hours)**Technical Algebra and Trigonometry**

Examines mathematical concepts from algebra and trigonometry. Includes vectors, phasor algebra, variation, trigonometric functions, coordinate systems, system of linear equations, quadratic, rational, exponential and logarithmic equations. MAT 61, MAT 65, MAT 71, MAT 75, or MAT 85, OR 2. Completion of MAT 55 and concurrent enrollment in MAT 126S, OR 3. KCTCS placement policy. Lecture: 3 credits (45 contact hours).

Pre-requisite: 1.

Attributes: Quantitative Reasoning AAS

Components: LEC: Lecture

MAT 126S (1-2 credit hours)**Corequisite Remediation for Technical Algebra and Trigonometry**

Provides supplementary instruction for students who do not meet college readiness standards in MAT 126. Covers content necessary for student success in MAT 126. Lecture: 1-2 credit hours (15-30 contact hours).

Co-requisite: MAT 126.

Attributes: Other

Components: LEC: Lecture

MAT 141 (3 credit hours)**Liberal Arts Mathematics**

Serves as a course in quantitative reasoning and problem solving intended for liberal arts majors. Includes voting methods, apportionment, interest and investments, probability, statistics, and geometry. (Students may not receive credit for both this course and MAT 146.). Lecture: 3 credit hours (45 contact hours).

Pre- or co-requisite: College Readiness or concurrent enrollment in MAT 141-S or MAT 61 or MAT 65 or MAT 71 or MAT 75.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 141S (1 credit hours)**Corequisite Remediation for Liberal Arts Mathematics**

Provides supplementary instruction for students who do not meet college readiness standards for MAT 141. Covers content necessary for success in MAT 141. Lecture: 1 credit hour (15 contact hours).

Co-requisite: MAT 141.

Attributes: Other

Components: LEC: Lecture

MAT 146 (3 credit hours)**Contemporary College Mathematics**

Serves as a course in quantitative reasoning and problem solving intended for non-science majors. Includes voting methods, finance, population growth, and at least two additional topics chosen from: apportionment, geometry, logic, probability and statistics, graph theory, number theory, game theory, and set theory. Math ACT score of 19 or above, OR 2. Successful completion of MAT 61, MAT 65, MAT 71, MAT 75, MAT 85, MAT 126, or equivalent, OR 3. KCTCS placement policy including concurrent enrollment in MAT 146S as appropriate. Lecture: 3.0 credits (45 contact hours).

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning, Course Also Offered in Modules

Components: LEC: Lecture

MAT 146S (1-2 credit hours)**Corequisite Remediation for Contemporary College Mathematics**

Provides supplementary instruction for students who do not meet college readiness standards for MAT 146. Covers content necessary for success in MAT 146. Lecture: 1-2 credit hours (15-30 contact hours).

Co-requisite: MAT 146.

Attributes: Other

Components: LEC: Lecture

MAT 150 (3 credit hours)**College Algebra**

Includes selected topics in algebra and analytic geometry. Develops manipulative skills and concepts required for further study in mathematics. Includes linear, quadratic, polynomial, rational, exponential, logarithmic and piecewise functions; systems of equations; and an introduction to analytic geometry. (Students may not receive credit for both MAT150 and any other College Algebra or Pre-calculus course. Credit not available on the basis of special exam.) Math ACT score of 22 or above; 2. Math ACT score of 19 -21 with concurrent MAT 100 workshop; 3. Successful completion of MAT 61, MAT 65, or MAT 75 with concurrent MAT 100 workshop; 4. Successful completion of MAT 71, MAT 85, MAT 126, or equivalent; or 5. KCTCS placement exam recommendation. Lecture: 3 credits (45 contact hours).

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning, Credit not permitted via STEP exam, Course Also Offered in Modules

Components: LEC: Lecture

MAT 151 (3 credit hours)**Introduction to Applied Statistics**

Serves as an entry-level introduction to applied statistics useful for a variety of fields. Covers statistical terminology and the appropriate use of software for the calculation of descriptive statistics, basic probability, correlation and linear regression. Emphasizes understanding the uses and misuses of statistics in the real world. (Same as STA 151.) (Students may not receive credit for both this course and any of the following: STA 151, STA 200, STA 210, STA 215.) Lecture: 3 credit hours (45 contact hours).

Pre-requisite: College Readiness in Mathematics.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 151S (1 credit hours)**Corequisite Remediation for Introduction to Applied Statistics**

Provides supplementary instruction for students who do not meet college readiness standards for STA 151 or MAT 151. Covers content necessary for success in STA 151 or MAT 151 as needed. Lecture: 1 credit (15 contact hours).

Attributes: Other, Supplemental Mathematics

Components: LEC: Lecture

MAT 154 (2 credit hours)**Trigonometry**

Includes trigonometric functions, identities, multiple analytic formulas, laws of sines and cosines, graphs of trigonometric functions, and inverse trigonometric functions. Lecture: 2.0 credits (30 contact hours).

Pre-requisite: Completion of MAT 71 or MAT 150 or a college intermediate algebra course or two years of high school algebra.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 155 (3 credit hours)**Trigonometry**

Includes the trigonometric functions, identities, multiple analytic formulas, laws of sines and cosines, graphs of trigonometric functions in rectangular and polar coordinates, and solving trigonometric equations. Emphasizes applications in each topic. (Students may not receive credit for both MAT155 and any other trigonometry or pre-calculus course.) Lecture: 3 credits (45 contact hours). Math ACT score of 22 or above, 2. Math ACT score of 19-21 with concurrent MAT150, 3. Successful completion of Intermediate Algebra, MAT 71, MAT 126, MAT 150, or equivalent; or 4. Placement exam recommendation.

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 159 (4 credit hours)**Analytic Geometry and Trigonometry**

Includes trigonometric functions, trigonometric identities, graphs of trigonometric functions, and inverse trigonometric functions, polynomial and rational functions, the Algebra of functions, exponential and logarithmic functions, and systems of equations. The course is not available for credit by special examination. The course is not available for credit to persons who have received credit for college algebra or trigonometry course. Lecture: 4.0 credits (60 contact hours).

Pre-requisite: Two years of high school algebra and a Math ACT score of 19 or above, or MA 108R (UK) or math placement test.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 160 (5 credit hours)**Precalculus**

Prepares students to enroll in a calculus sequence. Includes trigonometric functions, exponentials and logarithms, graphs, polar coordinates, conic sections, and systems of nonlinear equations. Students may not receive credit for both MAT 160 and either College Algebra or Trigonometry. Credit is not available by special examination. Lecture: 5 credits (75 contact hours). Math ACT score of 23 or above, 2. Placement exam recommendation, or 3. Consent of instructor.

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning, Credit not permitted via STEP exam

Components: LEC: Lecture

MAT 161 (5 credit hours)**Statistics and Algebra**

Serves as the entry-level mathematics class for students in business and related fields. Provides a survey of algebra and statistics topics necessary to prepare students for Brief Calculus and Applied Statistics. Develops fluency in the manipulation of polynomial, rational, radical, exponential, and logarithmic functions in order to solve equations, inequalities, and application problems. Familiarizes students with the graphs of the aforementioned functions. Includes nonlinear systems of equations. Covers statistical terminology and the appropriate use of software for the calculation of descriptive statistics, basic probability, correlation and linear regression. (Students may not receive credit for both this course and any of the following: STA 151, MAT 151, MAT 150.) ACT Math of 22 or MAT 71 or MAT 85 or 2. KCTCS placement policy and concurrent enrollment in MAT 161-S or 3. completion of MAT 61 and concurrent enrollment in MAT 161-S. Lecture: 5 credit hours (75 contact hours).

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 161S (2 credit hours)**Corequisite remediation for Statistics and Algebra**

Provides supplementary instruction for students who do not meet college readiness standards for MAT 161. Covers content necessary for success in MAT 161 as needed. Lecture: 2 credit hours (30 contact hours).

Co-requisite: MAT 161.

Attributes: Other

Components: LEC: Lecture

MAT 165 (3 credit hours)**Finite Mathematics and its Applications**

Examines finite mathematics with applications to business, biology and the social sciences including linear functions and inequalities, matrix algebra, linear programming, probability with emphasis on setting up mathematical models from stated problems. Lecture: 3 credits (45 contact hours).

Pre-requisite: MAT 150 or MAT 161 or equivalent.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 170 (3 credit hours)**Brief Calculus with Applications**

Provides an introduction to differential and integral calculus with applications in biological sciences, social sciences, physical sciences, or business with an analysis of algebraic, exponential, and logarithmic functions. (Students may not receive credit for both MAT 170 and MAT 175.) Lecture: 3 credits (45 contact hours).

Pre-requisite: Successful completion of MAT 150 or Math ACT 27 or above.

Attributes: QR - Quantitative Reasoning, Course Also Offered in Modules

Components: LEC: Lecture

MAT 171 (5 credit hours)**Precalculus**

Serves as the entry-level mathematics class for students in STEM fields. Prepares students for success in Calculus I. Develops fluency in the manipulation of polynomial, rational, radical, exponential, logarithmic, and trigonometric functions in order to solve equations, inequalities, and application problems. Familiarizes students with the graphs of the aforementioned functions. Includes linear and nonlinear systems of equations. Students may not receive credit for both MAT 171 and any other College Algebra, Trigonometry, or Precalculus course. Credit not available on the basis of special examination. Lecture: 5 credit hours (75 contact hours).

Pre-requisite: ACT Mathematics score of 23 or equivalent, or MAT 71 or MAT 85.

Attributes: QR - Quantitative Reasoning, Other

Components: LEC: Lecture

MAT 174 (4 credit hours)**Calculus I**

Includes topics from analytic geometry, derivatives and integrals of elementary functions, trigonometric functions, exponential functions, and logarithmic functions, and their applications. A course in one variable calculus. Lecture/Lab: 4.0 credits (75 contact hours).

Pre-requisite: MATH ACT score of 27 or above, or MAT 150 and MAT 154, or MAT 159, or consent of instructor.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 175 (5 credit hours)**Calculus I**

Examines one-variable calculus including limits, differentiation and integration of algebraic, trigonometric, exponential, logarithmic, hyperbolic, and inverse trigonometric functions with applications. Lecture: 5 credits (75 contact hours). College Algebra and Trigonometry, or equivalent, with grades of "C" or higher, 2. Math ACT 27 or above, 3. Placement exam recommendation, or 4. Consent of instructor.

Pre-requisite: 1.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 184 (4 credit hours)**Calculus II**

Stresses techniques of integration and infinite series. Includes transcendental functions and polar coordinates. A continuation of MAT 174. Lecture/Lab: 4.0 credits (75 contact hours).

Pre-requisite: MAT 174 with a grade of C or above.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 185 (5 credit hours)**Calculus II**

Includes applications of integration, advanced integration techniques, sequences and infinite series, and parametric and polar equations. Lecture: 5.0 credits (75 contact hours).

Pre-requisite: Calculus I, or equivalent, with grade of "C" or higher, or consent of the instructor.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 205 (3 credit hours)**Mathematics For Elementary and Middle School Teachers I**

Introduces problem solving, number and numeration systems, whole numbers, integers, rational and irrational numbers, and elementary number theory. Requires demonstration of basic skills in mathematics to receive credit in this course. Lecture: 3 credits (45 contact hours).

Pre-requisite: MAT 141 or MAT 146 or MAT 150 or MAT 161 or equivalent, with a minimum grade of "C".

Attributes: Other

Components: LEC: Lecture

MAT 206 (3 credit hours)**Mathematics For Elementary and Middle School Teachers II**

Introduces probability and statistics; geometric concepts including congruence and similarity; and measurement. Required demonstration of basic skills in mathematics to receive credit in this course. Lecture: 3 credits (45 contact hours).

Pre-requisite: MAT 141 or MAT 146 or MAT 150 or MAT 161 or equivalent, with a minimum grade of "C".

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 213 (4 credit hours)**Calculus III with Linear Algebra**

Examines multivariate calculus. Includes partial differentiation, multiple integration, vector calculus, and selected topics from linear algebra including matrices, linear independence of vectors, linear transformations, characteristic values and vectors. Offered primarily for STEM majors. Lecture/Lab: 4.0 credits (75 contact hours).

Pre-requisite: Successful completion of Calculus II.

Attributes: Other

Components: LAI: Integrated Laboratory, LEI: Integrated Lecture

MAT 214 (3 credit hours)**Calculus IV**

Focuses primarily on first and second order equations. Includes matrix solutions of systems of linear differential equations, both homogeneous and nonhomogeneous. Also includes series solutions, Bessel equations, Laplace transforms, and operator methods. Primarily for STEM majors. Lecture: 3.0 credits (75 contact hours).

Pre-requisite: Successful completion of Calculus III with Linear Algebra.

Attributes: Other

Components: LEC: Lecture

MAT 261 (3 credit hours)**Introduction to Number Theory**

Investigates topics from classical number theory, including discussions of mathematical induction, prime numbers, division algorithms, congruences, and quadratic reciprocity. Lecture: 3 credits (45 contact hours).

Pre-requisite: Consent of instructor.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 275 (4 credit hours)**Calculus III**

Examines multivariate calculus including parametric equations; rectangular, cylindrical, and spherical coordinate systems; vectors and vector-valued functions; limits and derivatives of functions of several variables; multiple integration; and line and surface integrals. Lecture: 4 credits (60 contact hours).

Pre-requisite: MAT185 or equivalent, or Consent of instructor.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 285 (3 credit hours)**Differential Equations**

Examines ordinary differential equations emphasizing first and second order equations and applications. Includes series solutions of second order equations and Laplace transform methods. Lecture: 3 credits (45 contact hours).

Pre-requisite: MAT275 or Consent of instructor.

Attributes: QR - Quantitative Reasoning

Components: LEC: Lecture

MAT 851 (0.3 credit hours)**Equations of Lines**

Covers the writing equations of lines from given data, verbal descriptions, and graphs; and writing the equation of a line parallel or perpendicular to a given line. Lecture: 0.3 credits (4.5 contact hours)

Pre-requisite: MAT 65 or MAT 75 or KCTCS placement examination.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 852 (0.6 credit hours)**Absolute Value and Inequalities**

Includes solving absolute value equations, compound inequalities; solving and graphing absolute value inequalities; and graphing linear inequalities in two variables. Lecture: 0.6 credits (9.0 contact hours).

Pre-requisite: MAT 851.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 853 (0.4 credit hours)**Rational Expressions**

Includes the simplification of rational expressions, performing basic operations with rational expressions, and solving equations with rational expressions. Lecture: 0.4 credits (6.0 contact hours).

Pre-requisite: MAT 852.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 854 (0.6 credit hours)**Radicals**

Covers the conversion between radical and rational exponent form, simplification of radicals, performance of operations with radicals, and the solution of equations involving radicals. Lecture: 0.6 credits (9.0 contact hours).

Pre-requisite: MAT 853.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 855 (0.3 credit hours)**Quadratics**

Includes solving quadratic equations with complex solutions using completing the square and the quadratic formula. Covers graphing parabolas by finding the vertex, finding the axis of symmetry, and plotting points. Lecture: 0.3 credits (4.5 contact hours).

Pre-requisite: MAT 854.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 856 (0.8 credit hours)**Functions**

Includes the evaluation of a function using function notation, determination of whether a given correspondence or graph represents a function, determination of the domain of a function, [and] identification of the range of a function. Includes modeling and solving applications based on linear, quadratic, and exponential functions. Lecture: 0.8 credits (12 contact hours).

Pre-requisite: MAT 855.

Attributes: Remedial - Mathematics

Components: LEC: Lecture

MAT 1101 (0.7 credit hours)**Logic and Reasoning**

Investigates concepts of logical symbolism, valid and invalid arguments. Uses applications throughout. Lecture: 0.7 credit (10.5 contact hours).

Pre-requisite: MAT 65 or equivalent as determined by KCTCS placement examination.

Attributes: Learn on Demand Only

Components: LEC: Lecture

MAT 1102 (0.8 credit hours)**Statistics**

Develops concepts of descriptive statistics. Emphasizes applications throughout. Lecture: 0.8 credit (12 contact hours).

Pre-requisite: MAT 65 or equivalent as determined by KCTCS placement examination.

Attributes: Learn on Demand Only

Components: LEC: Lecture

MAT 1103 (0.7 credit hours)**Algebra and Graphing**

Develops concepts of ratio and proportion, linear equations in two variables, inequalities, graphing and writing the equation of a line. Emphasizes applications throughout. Lecture: 0.7 credit (10.5 contact hours).

Pre-requisite: MAT 65 or equivalent as determined by KCTCS placement examination.

Attributes: Learn on Demand Only

Components: LEC: Lecture

MAT 1104 (0.8 credit hours)**Consumer Math, Geometry and Measurement**

Develops concepts of ratio and proportion, measurement, units and conversions, percents and interest. Emphasizes applications throughout. Lecture: 0.8 credit (12 contact hours).

Pre-requisite: MAT 65 or equivalent as determined by KCTCS placement examination.

Attributes: Learn on Demand Only

Components: LEC: Lecture

MAT 1461 (0.4 credit hours)**Voting Theory**

Explain voting theory and describe voting methods. Successful completion of Intermediate Algebra, MAT 126, or equivalent, or 3. KCTCS placement exam recommendation. Lecture: 0.4 credits (6 contact hours)

Pre-requisite: Math ACT score of 19 or above, 2.

Components: LEC: Lecture

MAT 1462 (1.1 credit hours)**Finance**

Analyze finances, calculate compound interest, analyze savings plans and investments, calculate installment loan payments, calculate income taxes, and analyze budgets. Lecture: 1.1 credits (16.5 contact hours).

Pre-requisite: MAT 1461.

Components: LEC: Lecture

MAT 1463 (0.5 credit hours)**Population Growth**

Calculate linear, exponential, and logarithmic growth. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: MAT 1462.

Components: LEC: Lecture

MAT 1464 (1 credit hours)**Contemporary Math Special Topics**

Analyze concepts and perform calculations in at least two of the special topics in contemporary college mathematics: Apportionment, probability and statistics, geometry, logic, graph, theory, number theory, game theory and set theory. Lecture: 1.0 credits (15 contact hours).

Pre-requisite: MAT 1463.

Components: LEC: Lecture

MAT 1701 (0.6 credit hours)**Limits**

Approximate limits graphically and numerically; evaluate limits analytically; list the conditions for the continuity of a function at a point; determine if a function is continuous or discontinuous at a point; determine the intervals of continuity of a function; and evaluate infinite limits and limits at infinity. Lecture: 0.6 credits (9 contact hours).

Pre-requisite: Successful completion of MAT 150 or Math ACT 27 or above.

Components: LEC: Lecture

MAT 1702 (0.8 credit hours)**Differentiation**

Define the derivative of a function; evaluate the derivative of a function using the definition; evaluate the derivative of a function using differentiation rules for algebraic functions and the product, quotient, and chain rules; use the derivative of a function to find the equation of a tangent line; perform implicit differentiation; define the differential; and use differentials to approximate function values. Lecture: 0.8 credits (12 contact hours).

Pre-requisite: MAT 1701.

Components: LEC: Lecture

MAT 1703 (0.6 credit hours)**Differentiation Applications**

Determine critical points; determine intervals on which a function is increasing or decreasing; identify relative extrema; identify inflection points and intervals on which a function is concave up or concave down. Solve application problems involving relative rates and optimization for biological, social, or physical sciences and business. Determine whether a function is differentiable at a point. Find the derivative of functions including polynomial, rational, root, exponential, and logarithmic functions. Lecture: 0.6 credits. (9 contact hours).

Pre-requisite: MAT 1702.

Components: LEC: Lecture

MAT 1704 (0.5 credit hours)**Integration**

Discuss the fundamental theorem of calculus. Find the average value of a function. Find indefinite and definite integrals of a function using integration rules for algebraic functions. Find definite and indefinite integrals using substitution. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: MAT 1703.

Components: LEC: Lecture

MAT 1705 (0.5 credit hours)**Applications of Integration**

Use definite integrals of find the area under a curve and between two curves. Find the integral of functions using polynomial, rational, root, exponential, and logarithmic functions. Solve application problems using integrals for biological, social, and physical sciences or business. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: MAT 1704.

Components: LEC: Lecture