MATHEMATICS (MATH)

MATH XXXX Mathematics
Three hours from one of the following: MATH 1003 College Mathematics MATH 1113 College Algebra Any higher level mathematics course

MATH 0803 Foundations of College Mathematics
Co-requisite: MATH 1003.
The purpose of this course is to prepare for college level mathematics those students whose mathematics background is inadequate. This course is a review of solving basic equations, operations, exponents, formulas, basic numeracy, statistics, percentages, scientific notation, conversions, and other mathematical skills. This course prepares students through a focus on problem solving, working with data, and emphasis on thinking critically. Note: A student who makes a D or F in MATH 0803 must repeat the course in each subsequent semester until he or she earns a grade of C or better. Students who make a grade of C or better in MATH 0803 must enroll in MATH 1003 the following semester. Note: The grade in the course will be computed in semester and cumulative grade point averages, but the course may not be used to satisfy general education requirements nor provide credit toward any degree.

MATH 0903 Beginning and Intermediate Algebra
Co-requisite: Students scoring below 17 on math section of the ACT; below 460 on the math section of the RSAT; or below 243 on arithmetic section of ACCUPLACER will be required to enroll in MATH 0900.
The purpose of this course is to prepare for college level mathematics those students whose mathematics background is inadequate. Content of the course is the language of algebra, fundamental operations, signed numbers, various equations, problem solving, special products and factoring, fractions, functions, graphs, exponents, and systems of linear equations. The course may not be used to satisfy general education requirements nor provide credit toward any degree. Note: A student who makes a D or F in MATH 0903 must repeat the course in each subsequent semester until he or she earns a C or better. Students who make a grade of C or better in MATH 0903 must enroll in MATH 1003 or MATH 1113 the following semester.
Note: The grade in the course will be computed in semester and cumulative grade point averages, but will not be calculated in earned hours.

MATH 1001 Orientation to Mathematics
This course serves as an orientation to the fields of mathematics and statistics, career opportunities in the fields, and the Mathematics and Statistics Department. The course concludes with the design and completion of a mini-project in a special interest area of mathematics or statistics.

MATH 1003 College Mathematics
ACTS Common Course - MATH 1113.
Co-requisite: Students not meeting the above prerequisite, will enroll in MATH 1003 and the co-requisite MATH 0803.
Prerequisite: Score of 19 or above on the math section of the ACTE; score of 500 or above on the math section of RSAT; score of 250 or above on the arithmetic section or quantitative reasoning, algebra, and statistics section of ACCUPLACER; or earn a grade of C* or higher in MATH 0803 or MATH 0903 or TMAT 1203.
This quantitative literacy course focuses upon the mathematics of contemporary life. Topics include using and understanding number quantities and measurement, statistics, probability, finances (personal, state and national), and mathematical modeling.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 1110 College Algebra Lab
Co-requisite: MATH 1113 with a math ACT score of 19 or 20.
The purpose of this course is to prepare students for college level mathematics whose mathematics background is inadequate. This a laboratory course designed to foster success in College Algebra and to provide additional active learning opportunities and assistance for application of the basic skills and concepts in College Algebra. The lab will take the major content areas from the college algebra class and reinforce the learning in those areas through extra practice and different perspectives.

MATH 1113 College Algebra
ACTS Common Course - MATH 1103.
Co-requisite: Students not meeting the above prerequisite but who score 19-20 on the math section of ACTE; score 500-520 the math section of RSAT; or score 250-252 on the Quantitative Reasoning, Algebra, and Statistics section of ACCUPLACER, will enroll in MATH 1113 and the co-requisite: MATH 1110.
Prerequisite: Score of 21 or above on the math section of the ACTE; score of 530 or above on the math section of RSAT; score of 253 or above on the quantitative reasoning, algebra, and statistics section of ACCUPLACER; or earn a grade of C* or better in MATH 0903.
Co-requisite: Students not meeting the above prerequisite but who score 17-18 on the math section of ACTE; score 460-490 the math section of RSAT; or score 243-249 on the Quantitative Reasoning, Algebra, and Statistics section of ACCUPLACER, will enroll in MATH 1113 and the co-requisite: MATH 0903. Exponents and radicals, introduction to quadratic equations, systems of equations involving quadratics, ratio, proportion, variation, progressions, the binomial theorem, inequalities, logarithms, and partial fractions. May not be taken for credit after completion of MATH 2703 or any higher level mathematics course.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 1203 Plane Trigonometry
ACTS Common Course - MATH 1203.
Prerequisite: Math ACTE score of 22 or higher, MATH 1113, or consent of Mathematics Department.
A study of the properties of the trigonometric functions and their graphs, solution of right and oblique triangles, formulas and identities, inverse functions, and trigonometric equations.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 1914 Precalculus
ACTS Common Course - MATH 1305.
Prerequisite: A math ACT score of 21 or above; score of 530 or above
on the math section of RSAT; score of 253 or above on the quantitative
reasoning, algebra, and statistics section of ACCUPLACER; or earn a
grade of C or better in MATH 1113.
This course is designed to provide additional mathematical background
before enrolling in the calculus sequence.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2033 Mathematical Concepts I
Prerequisite: MATH 1003 or 1113, elementary education major.
Elementary set theory, numeration systems, elementary number theory
and the real number system.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2043 Mathematical Concepts II
Prerequisite: A grade of C or better in MATH 2033, elementary education
major.
A continuation of MATH 2033, including a study of the elementary
concepts of probability and statistics, and an informal study of geometry.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2223 Quantitative Business Analysis
Prerequisite: A math ACT score of 22 or higher or grade of "C" or better in
MATH 1113.
This course is designed to develop the ability to use quantitative methods
in accounting, business, and economics; it includes models of cost,
revenue, and profit, linear programming, and probability.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2243 Calculus for Business and Economics
ACTS Common Course - MATH 2203.
Prerequisite: A math ACT score of 22 or above or a C or above
MATH 1113.
An introduction to the concepts of differentiation and integration.
Emphasis will be placed on applications of calculus in business,
economics, accounting, social sciences, and life sciences. May not be
taken for credit after completion of MATH 2914 or equivalent.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2703 Discrete Mathematics
Prerequisite: A grade of C or above in MATH 1113 or higher level
mathematics course.
A study of topics basic to mathematics and computer science. The topics
include logic, proofs, mathematical induction, set theory, combinatorics,
relations, and graph theory.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2914 Calculus I
ACTS Common Course - MATH 2405.
Prerequisite: Math ACT score of 26 or higher, or a grade of C or higher in
MATH 1914 or MATH 1203 or consent of instructor.
This is the first course in the calculus sequence that includes topics
on functions, limits, continuity, differentiation and its applications,
antiderivatives, inverse functions, and introduction to integration.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2924 Calculus II
ACTS Common Course - MATH 2505.
Prerequisite: C or above in MATH 2914 or equivalent.
A continuation of MATH 2914. Includes methods of integration and its
applications, sequences, and series.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 2934 Calculus III
ACTS Common Course - MATH 2603.
Prerequisite: C or above in MATH 2924 or equivalent.
Continuation of MATH 2924. The study of multi-dimensional calculus,
including vector functions, partial differentiation, multiple integration and
applications.
Note: A grade of C of better must be earned in this course if being used to
satisfy the general education mathematics requirement.

MATH 3003 Foundations of Advanced Mathematics
Prerequisite: MATH 2703.
A detailed presentation of the fundamental mathematical concepts
required to enter advanced mathematical coursework: sets, logic,
methods of mathematical proof, relations, functions, and cardinality.
Note: A grade of C or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3033 Methods of Teaching Elementary Mathematics
Prerequisite: A grade of C or better in MATH 2043 and admission to Stage
II.
A course on methods of teaching the mathematics of the elementary
school using mathematical concepts and principles taught in these
grades.
Note: A grade of C or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3123 College Geometry
Prerequisite: MATH 2924.
A formal approach to plane geometry with coordinates; sets, points,
lines, planes, distance, and coordinate systems, angles, congruence,
parallelism, and similarity.
Note: A grade of C or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3203 Introduction to Analysis
Prerequisite: MATH 3003.
A careful development of the real number system and the theory of
calculus on the real line.
Note: A grade of C or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3243 Differential Equations I
Prerequisite: C or above in MATH 2924.
A study of differential equations of the first order; linear equations of
higher order including the methods of undetermined coefficients and
variation of parameters; linear equations with constant coefficients;
special equations of order two and systems of linear first-order
differential equations using matrices.
Note: A grade of C or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3703 Mathematics in the Middle and Secondary Schools
This course is an in-depth study of the mathematics curriculum currently
taught in middle and secondary schools with an emphasis on content
knowledge for teaching. The course consists of classroom instruction
and may include a field component.
Note: A grade of "C" or better must be earned in the course used to satisfy
the general education mathematics requirement.

MATH 3771 Praxis Middle School and Secondary Mathematics Test Preparation
This course is designed to provide preservice teacher candidates with an intensive study of the mathematical knowledge and competencies assessed by the Praxis Mathematics: Middle School and Secondary Content Knowledge tests.

MATH 4003 Linear Algebra I
Prerequisite: MATH 2924.
Matrices and matrix algebra, systems of linear equations, determinants, eigenvalues, eigenvectors, general vector spaces, linear transformations.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4033 Abstract Algebra I
Prerequisite: MATH 3003 A study of Groups and other algebraic structures.
Topics include sub-groups, normal sub- groups, abelian groups, groups of permutations, homomorphisms, kernels, and range.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4103 Linear Algebra II
Prerequisite: MATH 4003 or the consent of the Department of Mathematics.
A continuation of MATH 4003 with emphasis on abstract vector spaces, inner product spaces, linear transformations, kernel and range, and applications of linear algebra. MATH 5103 may not be taken for credit after completion of MATH 4103 or equivalent.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4113 History of Mathematics
Prerequisite: MATH 2934.
A study of selected topics from the history and nature of mathematics from ancient to modern times. Emphasis will be placed on the historical development of mathematics through a study of biographies of prominent mathematicians and the evolution of some important mathematical concepts. The fundamental role of mathematics in the rise, maintenance, and extension modern civilization will be considered. MATH 5113 may not be taken for credit after completion of this course.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4123 Mathematical Modeling
Prerequisite: MATH 2703 and MATH 3243.
This course provides an introduction to the mathematical modeling process and applies this process to problems that may be modeled with pre senior level mathematics. Emphasis will be placed on connections of mathematics to application areas such as business, industry, economics, physical sciences, biological sciences, medicine and social sciences.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4203 Advanced Logic
Cross-listed: PHIL 4103.
Prerequisite: COMS 2903 or MATH 2703 or PHIL 3103.
A study of selected topics in advanced logic. Emphasis will be placed on proof theory, quantification theory, semantic tableaux, logicism, theories of completeness and consistency, and some consideration of the logical foundations mathematics.

MATH 4243 Differential Equations II
Prerequisite: MATH 3243 and MATH 4003 or consent of the instructor.
A continuation of MATH 3243 with emphasis on higher order and systems of differential equations.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4273 Complex Variables
Prerequisite: MATH 2934.
An introduction to complex variables. This course will emphasize the subject matter and skills needed for applications of complex variables in science, engineering, and mathematics. Topics will include complex numbers, analytic functions, elementary functions of a complex variable, mapping by elementary functions, integrals, series, residues and poles and conformal mapping. MATH 5273 may not be taken for credit after completion of this course.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4343 Introduction to Partial Differential Equations
Prerequisite: MATH 2934 and MATH 3243.
This course is an introduction to partial differential equations with emphasis on applications to physical science and engineering. Analysis covers the equations of heat, wave, diffusion, Laplace, Dirichlet and Neumann equations. Course is suitable for senior level or first year graduate students in Mathematics, Physics, and Engineering.
Note: A grade of C or better must be earned in the course used to satisfy the general education mathematics requirement.

MATH 4703 Special Methods in Mathematics
This course provides preservice teacher candidates with knowledge of current research and practice in mathematics education; a setting in which to apply that knowledge; and the opportunity to assess their teaching performance and formulate a plan for improvement.
Note: A grade of "C" or better must be earned in the course to be used to satisfy the general education mathematics requirement.

MATH 4951 Undergraduate Research in Mathematics
Offered: On demand.
Prerequisite: Departmental approval.
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4952 Undergraduate Research in Mathematics
Offered: On demand.
Prerequisite: Departmental approval.
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4953 Undergraduate Research in Mathematics
Offered: On demand.
Prerequisite: Departmental approval.
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4954 Undergraduate Research in Mathematics
Offered: On demand.
Prerequisite: Departmental approval.
Advanced students carry out independent research activity relating to a significant problem in a major field of study. Supervised by faculty member. Formal report and presentation required. One to four credits depending on problem selected and effort made.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4971 Mathematics Senior Seminar
Prerequisite: MATH 3203 or MATH 4033, or departmental approval.
Students will engage in a research project under the guidance of faculty research advisors. The research area will depend on the interests of the students and available expertise of faculty advisors. The students will present their findings before their peers, faculty advisors, and members of the Mathematics Department Assessment Committee.

MATH 4991 Special Problems in Mathematics
The content and credit for this course will be designed to meet the needs of the student.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4992 Special Problems in Mathematics
The content and credit for this course will be designed to meet the needs of the student.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4993 Special Problems in Mathematics
The content and credit for this course will be designed to meet the needs of the student.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 4994 Special Problems in Mathematics
The content and credit for this course will be designed to meet the needs of the student.
Note: A grade of C of better must be earned in this course if being used to satisfy the general education mathematics requirement.

MATH 5103 Linear Algebra II
Prerequisite: MATH 4003 or consent of the department of mathematics.
A continuation of MATH 4003 with emphasis on abstract vector spaces, inner product spaces, linear transformations, kernel and range, and applications of linear algebra.
Note: MATH 5103 may not be taken for credit after completion of MATH 4103 or equivalent.

MATH 5153 Applied Statistics II
Prerequisite: MATH 3153.
This course is a continuation of Math 3153 with emphasis on experimental design, analysis of variance, and multiple regression analysis. Students will be required to design and carry out an experiment, use a current statistical software package to analyze the data, and make inferences based upon the analysis.
Note: Math 5153 may not be taken for credit after completion of Math 4153 or equivalent.

MATH 5173 Advanced Biostatistics
Prerequisite: An introductory statistics course or permission of instructor.
This course will include analysis of variance, one factor experiments, experimental design with two or more factors, linear and multiple regression analysis, and categorical data analysis.

MATH 5243 Differential Equations II
Prerequisite: MATH 3243 and MATH 4003 or consent of the instructor.
A continuation of MATH 3243 with emphasis on higher order and systems of differential equations.
Note: May not be taken for credit after completion of MATH 4243 or equivalent.

MATH 5273 Complex Variables
Prerequisite: MATH 2943.
An introduction to complex variables. This course will emphasize the subject matter and skills needed for applications of complex variables in science, engineering, and mathematics. Topics will include complex numbers, analytic functions, elementary functions of a complex variable, mapping by elementary functions, integrals, series, residues and poles, and conformal mapping.
Note: May not be taken for credit after the completion of MATH 4273 or equivalent.

MATH 5343 Introduction to Partial Differential Equations
Prerequisite: MATH 2934 and MATH 3243.
This course is an introduction to partial differential equations with emphasis on applications to physical science and engineering. Analysis covers the equations of heat, wave, diffusion, Laplace, Dirichlet and Neumann equations. Course is suitable for senior level or first year graduate students in Mathematics, Physics, and Engineering.
Note: May not be taken for credit after completion of MATH 4343 or equivalent.

MATH 6213 Methods in Teaching Middle School Mathematics
Prerequisite: Permission of instructor.
The course is an exploration of inductive teaching models, techniques, strategies, and research for teaching mathematics in the middle school. Emphasis will be placed on constructivist learning.

MATH 6323 Methods in Teaching Secondary Mathematics
Prerequisite: Permission of the instructor.
The course is a study of materials, methods, and strategies for teaching mathematics in the secondary school. Emphasis will be placed on activity-based learning.

MATH 6881 Workshop
Prerequisite: Permission of instructor.
The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.

MATH 6882 Workshop
Prerequisite: Permission of instructor.
The workshop will require the equivalency of fifteen clock hours of instruction per credit hour.

MATH 6883 Workshop
Prerequisite: Permission of instructor.
The workshop will require the equivalency of fifteen clock hours of
instruction per credit hour.

MATH 6891 Independent Study
Open to graduate students who wish to pursue individual study or
investigation of some facet of knowledge which complements the
purpose of the University's graduate program. Students will be required to
plan their studies and prepare formal written reports of their findings.
Note: The selected topic may not constitute any duplication of study
leading to the accomplishment of a thesis.

MATH 6892 Independent Study
Open to graduate students who wish to pursue individual study or
investigation of some facet of knowledge which complements the
purpose of the University's graduate program. Students will be required to
plan their studies and prepare formal written reports of their findings.
Note: The selected topic may not constitute any duplication of study
leading to the accomplishment of a thesis.

MATH 6893 Independent Study
Open to graduate students who wish to pursue individual study or
investigation of some facet of knowledge which complements the
purpose of the University's graduate program. Students will be required to
plan their studies and prepare formal written reports of their findings.
Note: The selected topic may not constitute any duplication of study
leading to the accomplishment of a thesis.

MATH 6894 Independent Study
Open to graduate students who wish to pursue individual study or
investigation of some facet of knowledge which complements the
purpose of the University's graduate program. Students will be required to
plan their studies and prepare formal written reports of their findings.
Note: The selected topic may not constitute any duplication of study
leading to the accomplishment of a thesis.

MATH 6991 Project or Thesis Research Continuation
This course allows students additional time to research and compose
their capstone project/portfolio.