MATH 10 Elementary Algebra 3 Credits
Intended for students with little or no previous algebra. Topics include the real number system, operations with real numbers and algebraic expressions, linear equations and inequalities, polynomials, factoring, and introduction to quadratic equations. (This course is required for students with a mathematics proficiency level of 5. This course does not carry UWP degree credit.)

Components: Class
Prereqs/Coreqs: P MATH 5 or math placement level of 5

MATH 1030 Mathematics for Educators I 3 Credits
Math 1030 is the first semester in a three-semester sequence of integrated content and methods courses for preservice teachers. It is open only to students in elementary education pursuing certification levels B-11 or 10-14. (The course is not intended for students pursuing certification level 10-21.) Topics covered include problem solving, formal and informal argument, history and development of number systems, sets, fundamental operations with whole numbers and integers, foundational work with functions, and selected topics from statistics.

Components: Class
Prereqs/Coreqs: P MATH 15 with a grade of "C-" or better or mathematics proficiency level of 15 or above. (Open only to Elementary Education majors)

MATH 1040 Mathematics for Elementary Teachers 4 Credits
A mathematics content course for prospective elementary teachers. Emphasis is on development of properties of arithmetic. Topics also may include elementary concepts of algebra, probability, and statistics.

Components: Class
Prereqs/Coreqs: P A grade of C- or better in MATH 15 or MATH 1620, or consent of instructor

MATH 12 Mathematical Problem Solving 3 Credits
Mathematical modeling and basic algebra, including fractions and decimals, algebraic expressions and functions, and systems of linear equations and inequalities. Problem solving methods and strategies will be emphasized, as well as success skills such as study skills, time management, and note-taking. (This course does not carry UWP degree credit.)

Components: Class

MATH 15 Intermediate Algebra 3 Credits
Fundamental operations, factoring, fractions, equations, functions, graphing, exponents and radicals, linear equations, systems of equations, inequalities, polynomials, rational expressions, and quadratics. (This course does not carry UWP degree credit.)

Components: Class
Prereqs/Coreqs: P MATH 10 or 12 with a "C-" or better or mathematics proficiency level of 10 or above

MATH 1530 College Algebra 3 Credits
Equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, complex numbers, systems of equations. This course is equivalent to the first half of Math 2450. Students will not receive credit for both Math 1530 and Math 2450.

Components: Class
Prereqs/Coreqs: P MATH 15 with a grade of "C-" or better or mathematics proficiency level of 15 or above. (MATH 1530 and MATH 2530 may not be taken concurrently)

MATH 1620 Quantitative Reasoning 3 Credits
This course is intended to develop analytic reasoning and the ability to solve quantitative problems. Topics to be covered include construction and interpretation of graphs, functional relationships, descriptive statistics, geometry and spatial visualization, math of finance, exponential growth, and basic probability. Appropriate use of units and dimensions, estimates, mathematical notation and available technology will be emphasized throughout the course.

Components: Class
GE: Math competency
Prereqs/Coreqs: P MATH 10 or 12 with a grade of C- or better, or mathematics proficiency level of 10 or above

MATH 1630 Finite Mathematics with Applications 3 Credits
Coordinate systems and graphs, matrices, linear systems, linear programming (geometric approach), set theory, counting techniques, probability, Markov chains.

Components: Class
GE: Math competency
Prereqs/Coreqs: P MATH 15 with a C- or better or mathematics proficiency level of 15 or above
MATH 1730 Mathematics of Finance 3 Credits
Simple and compound interest, annuities, amortization, depreciation, valuation of securities, and bonds.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

MATH 1830 Elementary Statistics 3 Credits
An introduction to statistical analytical methods including graphing distributions, numerical summaries, linear regression and correlation, the normal distribution, confidence intervals and hypothesis tests for means and proportions, analyzing two-way tables, and analysis of variance. Minitab will be used throughout the course.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

MATH 1930 Mathematical Explorations 3 Credits
A course to enrich the students’ general education by presenting the spirit and some insights of mathematics. The course satisfies the Mathematics Competency requirement, but will not serve as a prerequisite for further math courses. Topics will illustrate the nature of contemporary mathematics and the relationship between mathematics and our cultural heritage. Some of the content and format of the course may vary depending on the instructor’s interests. All instructors of the course will include a common unit on mathematical reasoning and problem solving. Other content and format of the course may vary depending on the instructor’s interests.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 10 or MATH 12 or MATH 15 with a C- or better or mathematics proficiency level of 10 or above

MATH 2030 Mathematics for Educators II 3 Credits
Math 2030 is the second semester in a three-semester sequence of integrated content and methods courses for preservice teachers. It is open only to students in elementary education pursuing certification levels B-11 or 10-14. (The course is not intended for students pursuing certification level 10-21.) Topics covered include number theory; composition and decomposition of numbers including primes, factors, and multiples; using physical models to develop concepts of and operations on rational numbers; proportional reasoning; and number sense.
Components: Class
GE: Math (Elem/Mdl Educ Only)
Prereqs/Coreqs: P: MATH 1030 with a grade of "C-" or better. (Open only to Elementary Education majors)

MATH 2130 Discrete Structures 3 Credits
Sets, matrices, logic, permutations, combinations, relations, functions, trees, graph theory, and discrete probability.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 15 with a grade of "C-" or better or a mathematics proficiency level of 15 or above

MATH 2450 Precalculus 5 Credits
Solving equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions, trigonometric identities and formulas, complex numbers, systems of equations, and conic sections. This course is equivalent to taking both Math 1530 and Math 2530. Students who have credit for Math 1530 or Math 2530 should not take Math 2450.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 15 with a grade of "B-" or better or mathematics proficiency level of 20 or above

MATH 2530 Trigonometry and Analytic Geometry 3 Credits
Functions and their graphs, trigonometric and inverse trigonometric functions, trigonometric identities and formulas, solution of triangles, complex numbers, exponential and logarithmic functions, and conic sections. This course is equivalent to the second half of Math 2450. Students will not receive credit for both Math 2450 and Math 2530.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 1530 with a grade of "C-" or better or mathematics proficiency level of 30 or above
MATH 2620 Business Calculus with Applications 4-5 Credits
Primarily for students in business, the social sciences, and biological sciences who wish to acquire some knowledge of the techniques and applications of calculus. Topics include concepts, techniques, and applications of differential and integral calculus including multivariate calculus. Students who are preparing to major in mathematics, engineering, or physical sciences should enroll in the MATH 2650-MATH 2750 sequence.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 1530, MATH 2450 with a grade of C- or better, or mathematics proficiency level of 30 or above

MATH 2630 Business Calculus 3 Credits
Functions, limits, rates of change, exponential and logarithmic functions, differentiation, integration; with applications in the fields of business and economics.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 1530 or MATH 2450 with a grade of "C-" or better, or mathematics proficiency level of 30 or above

MATH 2640 Calculus and Analytic Geometry I 4 Credits
Limits and continuity, differentiation, differentials, antiderivatives, the definite integral and applications.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 2450 with a grade of "C-" or better, or mathematics proficiency level of 40

MATH 2650 Calculus I 5 Credits
Analytic geometry, functions, limits and continuity, the derivative, integrals, techniques and applications of differentiation, applications of integration, logarithmic and exponential functions, and trigonometric functions.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 2450 or MATH 2530 with a grade of C- or better, or mathematics proficiency level of 40

MATH 2660 Calculus II 5 Credits
Analytic geometry, functions, limits and continuity, the derivative, integrals, techniques and applications of differentiation, applications of integration, logarithmic and exponential functions, and trigonometric functions.
Components: Class
GE: Math competency
Prereqs/Coreqs: P: MATH 2450 or MATH 2530 with a grade of C- or better, or mathematics proficiency level of 40

MATH 2730 Discrete Mathematics 3 Credits
Logic, sets, combinations, relations, graphs, and discrete probability.
Components: Class
Prereqs/Coreqs: P: MATH 2640 with a grade of "C-" or better

MATH 2740 Calculus and Analytic Geometry II 4 Credits
Derivatives and integrals involving exponential, logarithmic, and inverse trigonometric functions, further study of limits, further techniques and applications of integration, sequences and series, polar coordinates, and parametric equations.
Components: Class
Prereqs/Coreqs: P: MATH 2640 with a grade of "C-" or better or advanced placement

MATH 2750 Calculus II 5 Credits
Techniques of integration, polar coordinates, conic sections, infinite series, and vectors of two and three dimensions.
Components: Class
Prereqs/Coreqs: P: A grade of C- or better in MATH 2650, or placement based on the AP exam

MATH 2840 Calculus and Analytic Geometry III 4 Credits
Analytic geometry of three dimensions, vector analysis, partial differentiation, multiple integrals, and line integrals.
Components: Class
Prereqs/Coreqs: P: MATH 2740 with a grade of "C-" or better or advanced placement

MATH 3010 Geometry for Elementary Teachers 4 Credits
A geometry content course for prospective teachers. We will cover topics which will increase the students' mathematical awareness and topics students need to master to become effective teachers in the elementary and middle school. Topics will include the NCTM Standards, topology, geometrical shapes, measurement, triangle congruence and similarity, coordinate geometry and transformations. An introduction to statistics and probability is also included. Our approach will be intuitive and investigative and will center on problem solving. Class time will be a combination of lecture, activities and discussion.
Components: Class
Prereqs/Coreqs: P: A grade of C- or better in MATH 15 or MATH 1620, or consent of instructor
MATH 3020 Teaching of Mathematics in the Middle and Secondary School 3 Credits
An analysis of the mathematics studied in the middle and secondary schools. Topics include the principles and standards implemented by the NCTM for teaching mathematics and the methods and materials used in educating students in mathematics.
Components: Class
Prereqs/Coreqs: P: MATH 2640 and MATH 2740 with a "B-" or better and junior standing and admission to the School of Education

MATH 3030 Mathematics for Educators III 3 Credits
Math 3030 is the third semester in a three-semester sequence of integrated content and methods courses for preservice teachers. It is open only to students in elementary education pursuing certification levels B-11 or 10-14. (The course is not intended for students pursuing certification level 10-21). Topics covered include names, properties, and relationships of two- and three-dimensional shapes; spatial sense; transformations including rotations, reflections, and translations; coordinate geometry; concepts of measurement including measurable attributes, standard and non-standard units, precision and accuracy, use of appropriate tools, the structure of systems of measurement; measurement including length, area, volume, size of angles, weight, mass, and temperature; indirect measurement and its uses, including developing formulas; formal and informal argument.
Components: Class
Prereqs/Coreqs: P: MATH 2030 with a grade of "C-" or better. (Open only to elementary education majors)

MATH 3040 Mathematics Seminar for Middle School Teachers 4 Credits
This course is intended to provide a background for teaching algebra and geometry in the middle school. This course will emphasize problem solving, communication, reasoning, representations, and making connections. Through problem-solving activities lead by either the instructor or students, the course will emphasize specific topics such as proportional reasoning, pattern finding, generalizing functional relationships, solving equations, area, perimeter, and volume. In particular, the course will emphasize the links between algebra and geometry, and when appropriate, will use relevant manipulatives including technology. The course will also emphasize pedagogical implications of current research regarding the teaching and learning of algebra and geometry.
Components: Class
Prereqs/Coreqs: P: MATH 2450 or MATH 2530 or mathematics proficiency level of 40 and MATH 3030 with a grade of "C-" or better

MATH 3130 College Geometry 3 Credits
Topics from Euclidean geometry including classical theorems, transformational geometry, and Euclidean constructions. Non-Euclidean topics include inversion and reciprocation, as well as some ideas from projective geometry. A dynamic geometry software program is used extensively to illustrate ideas in this course.
Components: Class
Prereqs/Coreqs: P: Math 2730 with a "C-" or better

MATH 3230 Linear Algebra 3 Credits
Matrices, systems of equations, determinants, eigenvalues, eigenvectors, vector spaces, linear transformations, and diagonalization. This class is intended to introduce students to formal mathematics. Students will be expected to write definitions, theorems, and proofs.
Components: Class
Prereqs/Coreqs: P: MATH 2740 with a grade of "C-" or better

MATH 3330 Modern Algebra 3 Credits
Study of the structure of abstract algebraic systems through formal proof. Deals primarily with groups, but also examines other algebraic systems including rings and fields.
Components: Class
Prereqs/Coreqs: P: MATH 2730 and MATH 3230 with a grade of "C-" or better in each or consent of instructor

MATH 3630 Differential Equations I 3 Credits
Solutions of first order differential equations, linear homogeneous and nonhomogeneous differential equations, Laplace transforms, linear systems and applications.
Components: Class
Prereqs/Coreqs: P: MATH 2840 with a grade of "C-" or better

MATH 3730 Numerical Analysis 3 Credits
This course is intended to provide an introduction to numerical methods. Topics will include computer arithmetic, solving nonlinear equations, numerical linear algebra, interpolation and curve fitting, and numerical differentiation and numerical integration.
Components: Class
Prereqs/Coreqs: P: MATH 3230 with a "C-" or better and COMPUTER 1430 with a "C-" or better

MATH 3830 Differential Equations II 3 Credits
Components: Class
Prereqs/Coreqs: P: MATH 3630 with a grade of "C-" or better
MATH 4030 Statistical Methods with Applications 3 Credits
Introduction to probability, density and distribution functions, special discrete and continuous distributions, estimation, hypothesis testing, chi-square, correlation and regression.
Components: Class
Prereqs/Coreqs: P: MATH 2740 with a grade of "C-" or better

MATH 4050 Applied Regression Analysis 3 Credits
A thorough investigation of regression methods used in statistics including linear regression models, multiple regression models, model building, residual analysis, and time series. Students in this course will also learn about the underlying mathematical models for the analyses. Students may not receive credit for both STAT 3130 and MATH 4050.
Components: Class
Prereqs/Coreqs: P: MATH 4030 with a grade of "C-" or better

MATH 4320 History and Development of Mathematical Concepts 3 Credits
A study of the history and development of mathematics from the primitive origins of numbers to modern mathematics.
Components: Class
Prereqs/Coreqs: P: MATH 2840 with a grade of "C-" or better

MATH 4330 Theory of Numbers 3 Credits
Integers, divisibility, prime numbers, Euclidean algorithm, linear Diophantine equations, congruences, Wilson's and Euler's theorems, Fermat's little theorem, and other selected topics.
Components: Class
Prereqs/Coreqs: P: MATH 2730 or MATH 3330 with a grade of "C-" or better

MATH 4430 Advanced Calculus 3 Credits
Study, through formal proof, of sets, functions, the real numbers, sequences, limits, continuity, differentiation, and integration.
Components: Class
Prereqs/Coreqs: P: Math 2730 with a C- or better or consent of instructor and Math 2840 with a C- or better

MATH 4530 Complex Variables 3 Credits
Complex numbers, complex functions, differentiation, elementary functions, integration, and infinite series.
Components: Class
Prereqs/Coreqs: P: MATH 2840 with a grade of "C-" or better

MATH 4620 Topics in Modern Mathematics 1-3 Credits
Topics to be selected by the instructor.
Components: Class
Prereqs/Coreqs: P: MATH 2840 with a grade of "C-" or better

MATH 4660 Cooperative Field Experience 1-8 Credits
Enhancement of the educational experience through placement of a student with a cooperating agency, business, industry or institution. The nature of the assignment, type of experience, number of credits, and evaluation procedure to be stipulated in a statement of agreement (learning contract) between the student and department.
Components: Field Studies

MATH 4710 Undergraduate Research 1-3 Credits
Students will work with a supporting faculty member on a research project. A maximum of 3 credits may be applied towards the Mathematics Major electives requirement.
Components: Research
Prereqs/Coreqs: P: Math 2740 with a grade of "C-" or better

MATH 4810 Senior Seminar 1 Credit
Development of library research techniques, organization and presentation of research findings beyond those formed in existing courses.
Components: Seminar
Prereqs/Coreqs: P: 12 credits of mathematics selected from MATH 3100 and above, including either MATH 4430 or MATH 3330 with a grade of "C-" or better

MATH 4920 Independent Study in Mathematics 1-3 Credits
Components: Independent Study
MATH 5 Basic Mathematics 2 Credits
Designed for students with minimum algebra background or who have been away from mathematics for several years. Subject areas to be covered include arithmetic of whole numbers, fraction and decimals, ratios and percents, and basic algebraic concepts. Prepares the student for Elementary Algebra (Math 10). This course does not carry UWP degree credit

Components: Class