Required Coursework for Secondary Education Mathematics Certification (grades 7-12)

MAT 131 Precalculus Mathematics (3 cr):
This course is an introduction to relations and functions including polynomial, rational, trigonometric, exponential and logarithmic functions and their graphs. Prerequisite: two years of high school algebra and satisfactory score on the Mathematics Placement Test.

MAT 204 Intro to Mathematical Logic (3 cr):
This course is an introduction to basic properties and operation of sets, functions and relations. A discussion of set cardinality, ordered sets, ordering theorems, set paradoxes, algebra of proposition and Boolean algebra. Number theory topics include: factorization, divisibility theory, congruencies, and Diophantine equations.

MAT 209 Probability and Statistics (4 cr):
This course covers theoretical principles and methods of probability and statistical analysis useful for natural science and education majors. Includes organization and analysis of data, descriptive statistics, laws of probability, binomial and normal distribution, random sampling, statistical inference, estimation and tests of hypotheses for large samples. Computer applications, using statistical software package SPSS, are required. Students earning credit for this course cannot earn credit for MAT 208. Prerequisite: high school algebra and satisfactory score on the Math Placement Test.

MAT 230 Calculus I (4 cr):
This course is an introduction to limits, continuity, differentiation, integration and their application. Prerequisite: four years high school mathematics or MAT 131, or satisfactory score on the Mathematics Placement Test.

MAT 231 Calculus II (4 cr):
This course includes applications and techniques of integration, derivatives and integrals of trigonometric, exponential and logarithmic functions. Techniques of integration. Prerequisite: MAT 230.

MAT 240 Linear Algebra (3 cr):
This course introduces the theory of matrices with applications using systems of equations, discussion of determinants, transformations and properties of vector spaces. Prerequisite: MAT 231.

MAT 307 Abstract Algebra (3 cr):
A study of group theory, permutations and cyclic groups, factor groups, rings, fields, integral domains, ideals, polynomial rings and vector spaces.

MAT 308 Modern Geometry (3 cr):
A study of transformations in the Euclidean plane, affine spaces and their transformations, projectives and their groups and axiomatic plane geometry.
MAT 332 Calculus III (4 cr):
A study of vectors in the plane, polar coordinates, infinite series, vectors in solid analytic geometry, functions of several variables, partial derivatives, multiple integrals and their applications. Prerequisite: MAT 231.

MAT 415 Math Seminar (3 cr):
This is a program of individual reading, discussion and student presentation of oral and written papers on selected topics in mathematics. Topics include history of mathematics as well as other areas not discussed in any of the student's previous mathematics courses. Prerequisite: junior or senior standing.

CIS 151 Intro to Computer Info Systems (3 cr):
(Paired with CIS 152) Constitutes the first year of the required sequence in CIS. First semester is heavily concept-oriented. Topics discussed: input and output hardware; secondary storage; memory; parts and functions of the CPU; systems development life cycle; intro to programming logic; steps from source to executable code; the relationship between the program and the operating system.

CIS 152 Intro to Programming I (3 cr):
Primarily logic development and structured programming, although concepts of systems analysis and design are reviewed. Programming features standard input and output, data types, declarations, and functions (including pass by value and pass by reference), as well as introduction to object orientation and the .NET framework. Importance of planning and documentation is stressed.

PHY 110 General Physics I (4 cr):
Introduction to standard non-calculus college physics course. Topics include Newton’s laws of motion, work, energy, impulse, momentum, properties of solids, liquids, and gases, heat, and the laws of thermodynamics. Course includes three hours laboratory per week. Prerequisite: high school algebra.

PHY 111 General Physics II (4 cr):
Continuation of Physics I. Topics include wave phenomena, electricity, magnetism, light, sound, optics, relativity and quantum theory. Prerequisite: PHY 110.

PSY 210 Educational Psychology (3 cr):
Investigates principles and practices related to learning and variety of factors that affect it. Prerequisite: PSY 101.