MATH 3406 Abstract Algebra (3,3,0)
This course covers some properties of groups, rings and fields. Permutation groups and polynomial rings are included. Application of permutation group on counting and application of finite field on error correcting code are included.

MATH 3407 Advanced Linear Algebra (3,3,0)
Prerequisite: MATH 2207 Linear Algebra
This course is designed for mathematical science major students. General vector space, linear transformations, inner products, diagonal form, Jordan form, dual space and quadratic forms will be introduced. The course emphasizes on general theory of linear algebra.

MATH 3415 Vector Calculus (3,3,0)
Prerequisite: MATH 2205 Multivariate Calculus and MATH 2207 Linear Algebra
This course is designed to develop the intuitive understanding, theory, and computational skills necessary for the concepts of vector functions by tying together multivariate calculus with concepts of vector. Topics covered include Vector Fields, Stokes theorem, Green's theorem, Gauss' theorem, and their applications.

MATH 3416 Complex Analysis (3,3,0)
Prerequisite: MATH 2215 Mathematical Analysis or MATH 2217 Advanced Calculus II
This course provides an up-to-date introduction to the basic theory of analytic functions of one complex variable. Residue Theorem and its applications to the evaluation of integrals and sums will be one of the main objectives. Also conformal mappings and their applications will be discussed.

MATH 3417 Game Theory (3,3,0)
The purpose of this class is to provide an introduction to game modeling and theory. In studying of strategic behavior among parties having apposed, mixed or similar interests, students will be able to think strategically, understand and explain a wide range of problems. Students will learn how to recognize and model strategic situations, to predict when and how your actions will influence the decisions of others and to exploit strategic situations for your own benefit. It is also important to emphases that game theory is a deductive, mathematical enterprise; therefore, it requires abstract, symbolic reasoning. The major topics covered are strategic games, extensive games with perfect and imperfect information, and coalitional games.

MATH 3425 Graph Theory (3,3,0)
This course covers some fundamental concepts and principles of graph theory. Some algorithms of graphs are also discussed. Students will learn some techniques to solve some graph problems.

MATH 3426 Number Theory (3,3,0)
This course provides an introduction to the theory of numbers. Basic concept such as divisibility, congruence, diophantine equations will be covered. Some applications such as cryptography will be introduced.

MATH 3427 Real Analysis (3,3,0)
Prerequisite: MATH 2215 Mathematical Analysis or MATH 2217 Advanced Calculus II
This course provides an introduction to measure theory, Lebesgue integration, L^p spaces, and Fourier analysis. Equipped with this knowledge, students are prepared for further studies in numerical analysis, functional analysis and advanced probability theory.

MATH 3495 Job Practicum I (1,0,0)
Prerequisite: Year 2 or Year 3 students. Students must receive permission from the internship coordinator in advance.
The course aims to enhance students' competitiveness for future employment, and to build a channel through which they can reach their potential employers. Students will work in an organization or a company as interns and complete work assignment that are primarily related to their major study.

MATH 3496 Job Practicum II (1,0,0)
Prerequisite: Year 2 or Year 3 students. Students must have taken or must be concurrently taking MATH 3495 Job Practicum I. Students must receive permission from the internship coordinator in advance.
The course aims to enhance students' competitiveness for future employment, and to build a channel through which they can reach their potential employers. Students will work in an organization or a company as interns and complete work assignment that are primarily related to their major study.

MATH 3497 Job Practicum III (1,0,0)
Prerequisite: Year 2 or Year 3 students. Students must have taken MATH 3495 Job Practicum I, and must have taken or be concurrently taking MATH 3496 Job Practicum II. Students must receive permission from the internship coordinator in advance.
The course aims to enhance students' competitiveness for future employment, and to build a channel through which they can reach their potential employers. Students will work in an organization or a company as interns and complete work assignment that are primarily related to their major study.

MATH 3605 Numerical Methods II (3,3,0)
Prerequisite: MATH 3206 Numerical Methods I, MATH 3405 Ordinary Differential Equations
This is the continuation of the Numerical Methods I. The course covers the concepts of Discrete/Fast Fourier Transform (DFT/FFT), the concepts of optimization, numerical methods for solution of systems of nonlinear equations, numerical methods for optimization and algorithms for solutions of initial value problems and boundary value problems for ordinary differential equation. The constructions of the algorithms and their advantages and limitations will be discussed so that the results of the computations can be properly interpreted.

MATH 3606 Partial Differential Equations (3,3,0)
Prerequisite: MATH 2205 Multivariate Calculus, MATH 3405 Ordinary Differential Equations
This course introduces the theory of multi-dimensional scalar and system of parabolic, elliptic and hyperbolic partial differential equations (PDEs) that model physical processes in areas such as physics, biology, chemistry and social science. Solution techniques such as the separation of variables, eigenfunction expansions, Green functions, Fourier and Laplace transforms for solving the equations in a bounded and unbounded domain, with homogeneous and inhomogeneous source term will be studied in detail. Some classical numerical methods such as finite difference schemes and finite elements schemes for solving partial differential equations will also be introduced.

MATH 3615 Introduction to Imaging Science (3,3,0)
Prerequisite: MATH 1005 Calculus or MATH 1006 Advanced Calculus I
This course aims to introduce students to the foundation of digital image analysis. Students will learn elementary point operation techniques for image enhancement, and advanced techniques (including the theory of Fourier transform) for image restoration and image analysis. Students will come to understand all the major issues involved in the design and implementation of a digital imaging system.

MATH 3616 Numerical Methods for Differential Equations (3,3,0)
Prerequisite: MATH 3606 Partial Differential Equations and MATH 3206 Numerical Methods I or MATH 3605 Numerical Methods II (*recommended*)
This course introduces the major numerical techniques for solving partial differential equations. Emphasis is placed on finite difference methods and finite element methods. Some typical engineering problems, such as shock waves, are analysed.