ideas of numerical analysis. Emphasis is placed on the study of underlying principles, error bounds, convergence theorems, etc. in the area of numerical analysis.

MATH 3650 Topology (3,3,0)
Prerequisites: MATH 1111-2 Mathematical Analysis I & II
This course covers the essential concepts of topological spaces. Important topological properties are also taught to lay the ground work for further studies.

MATH 3660 Operations Research II (3,3,0)
Prerequisite: MATH 1120 Linear Algebra
This course aims to introduce students to some fundamental and advanced topics in operations research. Students will learn theory, techniques, and applications of integer programming, queuing theory, Markov decision process, and nonlinear programming.

MATH 3670 Differential Geometry (3,3,0)
Prerequisites: MATH 1120 Linear Algebra and MATH 2110 Differential Equations
This course teaches students the mathematical tools of classical differential geometry. Applications to curve and surface designs are also given.

MATH 3680 Applied Functional Analysis (3,3,0)
Prerequisites: MATH 1111-2 Mathematical Analysis I & II, MATH 1120 Linear Algebra, and MATH 2130 Real Analysis
This course aims at familiarizing the student with the basic concepts, principles and methods of functional analysis and its applications. Functional analysis plays an important role in the applied sciences as well as in mathematics itself. Roughly speaking, functional analysis develops the tools from calculus and linear algebra further to the more general setting where one has vector spaces comprising functions or general abstract infinite-dimensional vector spaces. Problems from various application areas can then be conveniently posed in this common general set up, and solved using the techniques of functional analysis. The basic objects studied in functional analysis are vector spaces with a notion of distance between vectors, and continuous maps between such vector spaces. This interplay between the algebraic and analytic setting gives rise to many interesting and useful results, which have a wide range of applicability to diverse mathematical problems, such as from numerical analysis, differential and integral equations, optimization and approximation theory.

MATH 3720 Complex Analysis (3,3,0)
Prerequisites: MATH 1111-2 Mathematical Analysis I & 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 3760 Abstract Algebra (3,3,0)
Prerequisite: MATH 1120 Linear Algebra
This course covers some properties of groups, rings and fields. Permutations groups and polynomial rings are included. Application of permutation group on counting and application of finite field on error correcting code are included.

MATH 3780 Geometries: Theory and Applications (3,3,0)
Prerequisite: Year III standing
The study of geometry has come a long way since the brilliant work in Euclid's Elements. This course aims at enhancing students' understanding and appreciation of the salient branches of geometry, including the development and applications of Euclidean and non-Euclidean geometries, differential geometry, and fractals.

MATH 3830 Numerical Linear Algebra (3,3,0)
Prerequisites: MATH 1120 Linear Algebra, MATH 2140 Numerical Methods I
This course aims to provide a thorough discussion of the advanced topics and state of art development in numerical linear algebra. This subject emphasizes on both the theoretical analysis and the computer applications of numerical linear algebra in various areas.

MATH 3840 Numerical Analysis of Delay Differential and Volterra Function Equations (3,3,0)
Prerequisites: MATH 1120 Linear Algebra and MATH 2140 Numerical Methods I or consent of the instructor
This course will provide a thorough introduction to the numerical analysis and the computational solution of functional differential and integral equations with delay (or retarded) arrangements. Starting with a brief review of the basic theory of delay differential and more general Volterra functional equations, it will lead the students to the current "state of the art" in this very active area of numerical analysis.

MATH 3850 Optimization Theory and Techniques (3,3,0)
Prerequisite: Year II or Year III standing, or consent of the instructor
This course aims to provide the fundamental theory and techniques in unconstrained and constrained optimization, to introduce some existing numerical software packages, and to offer some interdisciplinary techniques and applications related to optimization.

MATH 3980 Special Topics in Mathematics (3,3,0)
This course is devoted to the study of up-to-date and important topics in different areas of applied mathematics. Emphasis is laid on the continuation and consolidation of those fundamental applied courses offered in the programme. It is specifically designed with the flexibility to take advantage of visiting scholars from other institutions to introduce topics that are under current research.

MATH 3990 Advanced Topics in Mathematics (3,3,0)
This course is devoted to the study of up-to-date and important topics in different areas of applied mathematics. Emphasis is laid on the continuation and consolidation of those fundamental applied courses offered in the programme. It is specifically designed with the flexibility to take advantage of visiting scholars from other institutions to introduce topics that are under current research.

MATH 7010 Topics in Graph Theory (3,3,0)
Prerequisite: Postgraduate standing or consent of instructor
This course provides fundamental concepts and principles of graph theory to students who might be interested to pursue research in that field, or to graduate students who wants exposure to graph theory. It will give a survey on recent results and possible research directions. While graduate standing in Mathematics or related area may find this subject useful.

MATH 7020 Finite Element Methods (3,3,0)
Prerequisite: Postgraduate standing or consent of instructor
To introduce the concepts of finite element methods, typical elements in engineering applications, demonstrate the use of software packages, and to introduce the convergence theory of the finite element method.

MATH 7030 Numerical Linear Algebra (3,3,0)
Prerequisite: Postgraduate standing or consent of instructor
This course covers the advanced topics in numerical linear algebra. Theoretical issues as well as practical computer applications will be addressed.

MATH 7050 Optimization Theory and Techniques (3,3,0)
Prerequisite: Postgraduate standing or consent of instructor
This course introduces the fundamental theory and techniques for both unconstrained and constrained optimization. Overview of the existing numerical software packages will be addressed.