Course Description

Introduction to Analysis 1			
Yr. : 2	Sem. : 1	Course Code:	AP0003
This course is the first part of introduction to analysis. Topics of this course are real number system, limit and continuity of function, single variable calculus, and elementary transcendental function.			
Linear Algebra			
Yr. : 2	Sem. : 1	Course Code:	AP0005
This course covers vector space, properties of matrices and determinants, linear transformations, dual space, eigenvalues and eigenvectors.			
Programming Language			
Yr. : 2	Sem. : 1	Course Code:	AP0006
Students in this course will learn the basics of problem solving with computer, and will emphasize how to use C or Java programming language to solve mathematical problems.			
Set Theory			
Yr. : 2	Sem. : 1	Course Code:	AP0004
This course deals with axiom, propositional logic, relation and function, countable set, cardinal number, axiom of choice, ordered set, well-ordered set, and ordinal number.			
Introduction to Statistics			
Yr. : 2	Sem. : 1	Course Code:	AP0007
This course covers descriptive statistics, probability, probability distribution, and statistical hypothesis testing.			
Modern Geometry			
Yr. : 2	Sem. : 1	Course Code:	AP0063

Topics of this course are basic concepts and theories of curvature and tensor, curvature tensor, Euler-Lagrange equation.

Introduction to Analysis 2

Yr. : 2	Sem. : 2	Course Code:	AP0010

This course is the second part of introduction to analysis. Topics of this course are real number system, limit and continuity of function, single variable calculus, and elementary transcendental function.

Object-oriented Programming

Yr. : 2	Sem. : 2	Course Code:	AP0055

In this course, students will learn one of object-oriented programming language, C++, so that they can understand the need and basic concept of object-oriented programming skills.

Number Theory

Yr. : 2	Sem. : 2	Course Code:	AP0013

Topics include properties of integers, prime numbers, Diophantine equation, congruence, primitive root, and quadratic residue.

Differential Equations

Yr. : 2	Sem. : 2	Course Code:	AP0015

This course introduces first, second, and higher order differential equations using a variety of methods including analytic methods, graphical methods, series solution, Laplace Transforms, numerical methods and partial differential equations.

Actuarial Statistics

Yr. : 2	Sem. : 2	Course Code:	AP0065

This course covers the basics of actuarial statistics including utility function, risk model, survival function, force of mortality, function of life table, insurance premium rate, reserve fund, reserve for outstanding claims, and annuity.

Statistical Software and Practical Use			
Yr. : 2	Sem. : 2	Course Code:	AP0014
In this course, students will learn how to use SAS, SPSS, Minitab for summarizing and analyzing data, estimation and hypothesis testing, regression analysis, non-parametric statistics, and time-series analysis.			
Modern Algebra 1			
Yr. : 3	Sem. : 1	Course Code:	AP0017
This course is the first part of modern algebra. This course deals with group, Lagrange's theorem, isomorphism theorem, normal subgroup, quotient group, ideal, maximal ideal, prime ideal, quotient ring, field, ruler and compass constructions, and Galois group.			
Visual Programming			
Yr. : 3	Sem. : 1	Course Code:	AP0051
This course introduces how to use Visual C++. They review object-oriented programming and learn MFC.			
Discrete Mathematics			
Yr. : 2	Sem. : 1	Course Code:	AP0011
In this course, we will study set, permutation, generating function, difference equations, graph, and tree.			
Mathematical Statistics 1			
Yr. : 3	Sem. : 1	Course Code:	AP0066
In this course, we cover the basics of probability, random variable, expected value, probability density function, moment generating function, and properties of discrete probability distribution and continuous probability distribution.			
Numerical Analysis 1			
Yr. : 3	Sem. : 1	Course Code:	AP0068

This course is the first part of numerical analysis. Topics are numerical solutions of equations in one variable and linear systems, interpolation, numerical differentiation and integration, iterative techniques, approximating eigenvalues, least squares approximation, numerical solutions of differential equations, finite difference method and finite element method.

Regression Analysis			
Yr. : 3	Sem. : 1	Course Code:	AP0053

Students will learn one of statistical methods, regressing analysis, which covers basic linear regression model, multiple linear regression model, and regression diagnostics.

Complex Analysis 1			
Yr. : 3	Sem. : 1	Course Code:	AP0070

This course covers real number system and complex number system, curves on complex plane, elementary complex-valued function, theory of radical root, regular function, and power series.

Modern Algebra 2			
Yr. : 3	Sem. : 2	Course Code:	AP0024

This course is the second part of modern algebra. This course deals with group, Lagrange's theorem, isomorphism theorem, normal subgroup, quotient group, ideal, maximal ideal, prime ideal, quotient ring, field, ruler and compass constructions, and Galois group.

Differential Geometry			
Yr. : 3	Sem. : 1	Course Code:	AP0072

This course deals with curves in Euclidean spaces, curvature, Frenet formula, natural equation, and parametric representation of surfaces.

System Programming			
Yr. : 4	Sem. : 1	Course Code:	AP0064

Students in this course are expected to understand how to mathematical programming applicable to applied

mathematics.

Mathematical Statistics 2			
Yr. : 3	Sem. : 2	Course Code:	AP0067

In this course, we cover the basics of probability, random variable, expected value, probability density function, moment generating function, and properties of discrete probability distribution and continuous probability distribution.

Data Analysis			
Yr. : 3	Sem. : 2	Course Code:	AP0058

Students will learn general process of data Analysis from gathering data to problem solving using statistical techniques.

Cryptography			
Yr. : 4	Sem. : 1	Course Code:	AP0032

This course introduces the basics of cryptology and cryptographic techniques including classic cryptography, block cipher system, public key crypto system, authentication and signature, and cryptographic protocol.

Topology			
Yr. : 4	Sem. : 2	Course Code:	AP0033

This course introduces basic properties of topological spaces, relative topology, connectivity, continuity, separation axiom and countability axiom, metric space, and compact space.

Complex Analysis 2			
Yr. : 3	Sem. : 2	Course Code:	AP0071

This course covers real number system and complex number system, curves on complex plane, elementary complex-valued function, theory of radical root, regular function, and power series.

Partial Differential Equations

Yr. : 4	Sem. : 1	Course Code:	AP0076
This course introduces Elliptic, Parabolic, Hyperbolic partial differential equations such as Laplace equation, Heat equation, Wave equation, and their numerical solutions. * Related courses: Differential Equation, Numerical Analysis 1, 2			

Actuarial Mathematics 1			
Yr. : 4	Sem. : 1	Course Code:	AP0054
This course is the first part of actuarial mathematics. Topics include the present price, accumulated price, nominal interest rate, nominal discount rate, net present value, internal rate of return, and several annuities.			

Window Application Programming			
Yr. : 3	Sem. : 2	Course Code:	AP0073
This course will discuss the theory of window programming. Students in this course are expected to understand how to mathematical programming applicable to applied mathematics.			

Combinatorics			
Yr. : 4	Sem. : 2	Course Code:	AP0037
This course introduces the basics of combinatorics including Brunside theorem based on permutation group, covers Polya counting, graph theory, and combinatorial designs.			

Mathematical Modeling			
Yr. : 4	Sem. : 2	Course Code:	AP0077
This course deals with mathematical models in various fields including natural sciences, engineering, finance, and problem solving using programming. * Related courses: Differential Equation, Numerical Analysis 1, 2, Partial Differential Equations			

Real Analysis			
Yr. : 4	Sem. : 1	Course Code:	AP0060
Topics of this course are real-number field, Lebesgue measure and integral, absolute continuity, Banach space,			

Hahn-Banach theorem, and Closed graph theorem.

Actuarial Mathematics 2

Yr. : 4	Sem. : 2	Course Code:	AP0061

This course is the second part of actuarial mathematics. Topics include varying annuity, life table, future remaining lifetime, complete expectation of life, life insurance and life annuity.

Numerical Analysis 1

Yr. : 3	Sem. : 2	Course Code:	AP0069

This course is the second part of numerical analysis. Topics are numerical solutions of equations in one variable and linear systems, interpolation, numerical differentiation and integration, iterative techniques, approximating eigenvalues, least squares approximation, numerical solutions of differential equations, finite difference method and finite element method.