

BS MATHEMATICS CURRICULUM
Effective SY 2017-2018

FIRST YEAR

FIRST SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
CCS 1M	Fundamentals of Computing 1	3
CHS 1	Reading and Interpreting the Hebrew Scriptures	3
GE 1	Understanding the Self	3
GE 3	The Contemporary World	3
GE 4	Mathematics in the Modern World	3
GE 5	Purposive Communication	3
NSTP 1	National Service Training Program	3
PE 1	Physical Fitness & Swimming	2
PEP 1	Personal Enhancement Program	NC
TOTAL:		23

SECOND SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
MATH 14	Fundamental Concepts of Math	3
CCS 2M	Fundamentals of Programming	3
CHS 2	Reading and Interpreting the Christian Scriptures	3
GE 10	Whole Person Education	3
GE 2	Readings in Philippine History	3
GE 6	Art Appreciation	3
NSTP 2	National Service Training Program	3
PE 2	Physical Education	2
PEP 2	Personal Enhancement Program	NC
TOTAL:		23

SECOND YEAR

FIRST SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 21	Linear Algebra	3
Math 23	Calculus 1	5
Math 25	Abstract Algebra I	3
Chem 14	Chemistry for Engineers	4
GE 7	Science, Technology & Society	3
PE 3	Physical Education	2
Phys 1	Selected Topics in Mechanics, Acoustics & Thermo Dynamics	4
TOTAL:		24

SECOND SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 22	Modern Geometry	3
Math 24	Calculus II	5
Math 26	Abstract Algebra II	3
Math 28	Number Theory	3
ELS 22	Technical Writing in the Profession (GE 11 elec)	3
GE 8	Ethics	3
PE 4	Physical Education	2
Philo 12	Logic and Critical Thinking	3
TOTAL:		25

THIRD YEAR

FIRST SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 31	Calculus III	5
Math 33	Operations Research 1	3
Math 35	Statistical Theory	3
Math 37	Graph Theory and Applications	3
ED	Educ Elective 1	3
FL	Foreign Language	3
GE 9	The Life and Works of Jose Rizal	3
TOTAL:		23

SECOND SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 32	Advanced Calculus 1	3
Math 34	Differential Equations 1	3
Math 36	Probability	3
Math 38	Applied Multivariate Analysis	3
CHS 3	Christianity and Peace-Building	3
FL	Foreign Language	3
ED	Educ Elective 2	3
TOTAL:		21

FOURTH YEAR

FIRST SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 41	Complex Analysis	3
Math 43	Advanced Calculus 2	3
Math 45	Numerical Analysis	3
Math 47	Topology	3
Math 49	Math Research 1	3
ED	Educ Elective 3	3
ED	Educ Elective 4	3
TOTAL:		21

SECOND SEMESTER		
SUBJ CODE	COURSE TITLE	UNITS
Math 42	Actuarial Mathematics	3
Math 44	Mathematical Statistics	3
Math 48	Real Analysis	3
Math 52	Math Research 2	3
ED	Educ Elective 5	3
ED	Educ Elective 6	3
TOTAL:		18

Course Descriptions

CCS 1M Fundamentals of Computing 1

3 units (lec/lab)

Pre-requisite:

This course introduces fundamental programming constructs: types, control structures, functions, I/O, basic data structures using the C programming language. In-class lectures and discussions are supplemented by computer hands-on sessions.

CCS 2M Fundamentals of Computing 2

3 units (lec/lab)

Pre-requisite: CCS 1M

This course covers advanced programming concepts and techniques using Java C++ or other suitable object-oriented programming languages. Topics include recursion, abstract data types, advanced path structures, programming interfaces, object-oriented programming, inheritance, polymorphism, event handling, exception handling, API programming. In-class lectures and discussions are supplemented by computer hands-on sessions.

GE 4 Mathematics in the Modern World

3 units (lec)

Pre-requisite:

This course deals with nature of mathematics, appreciation of its practical, intellectual, and aesthetic dimensions, and application of mathematical tools in daily life.

Math 14 Fundamental Concepts in Mathematics

3 units (lec)

Pre-requisite:

This course covers sets, principles of logic, methods of proof relations, functions, integers, binary operations, complex numbers, matrices and matrix operations, and an introduction to mathematical systems.

Math 21 Linear Algebra

3 units (lec)

Pre-requisite: Math 14

This course covers matrices, systems of linear equations, vector spaces, linear independence, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization, and inner product spaces.

Math 22 Modern Geometry

3 units (lec)

Pre-requisite: Math 21, 25

The first part of the course focuses on Euclidean and affine geometry on the plane. The second half may continue with Euclidean Geometry on the sphere; alternatively, an introduction to finite geometries and to non-Euclidean hyperbolic and elliptic geometries. Interrelation of tools from Geometry, Linear Algebra and Abstract Algebra.

Math 23 Calculus 1

5 units (lec)

Pre-requisite:

This is a first course in calculus. It covers limits, continuity, derivatives of algebraic and transcendental functions (exponential, logarithmic, trigonometric, hyperbolic and their inverses), applications of derivatives, differentials; antiderivatives, definite integrals, Fundamental Theorem of Calculus, and applications of definite integrals.

Math 24 Calculus II

5 units (lec)

Pre-requisite: Math 23

This course is the second of a series of three calculus courses. It covers techniques of integration, parametric equations and polar coordinates, cylindrical surfaces, surfaces of revolution and quadric surfaces; vectors and vector-valued functions; functions of several variables; limits and continuity of functions of several variables; partial derivatives and the total differential; directional derivative; relative and absolute extrema of functions of several variables.

Math 25 Abstract Algebra 1

3 units (lec)

Pre-requisite: Math 14

This course covers groups, subgroups, cyclic groups, permutation groups, abelian groups, normal subgroups, quotient groups and homomorphism and isomorphism theorems, rings, integral domains, field, ring homomorphism, ideal, and field quotients.

Math 26 Abstract Algebra 2

3 units (lec)

Pre-requisite: Math 25

This course covers rings of polynomials, fundamental theorem of field theory, extension fields, algebraic extensions, finite fields, geometric constructions, fundamental theorem of Galois theory, illustration of Galois theory.

Math 28 Number Theory	3 units (lec)	Pre-requisite: Math 25
Divisibility, Diophantine, Equations, Prime Numbers, Congruences, Multiplicative functions, Solutions to equations involving congruences, sums of squares, primitive roots, Quadratic reciprocity.		
Math 31 Calculus 3	5 units (lec)	Pre-requisite: Math 24
This course covers sequences and series; double and triple integrals; applications of multiple integrals; vector fields; line and surface integrals.		
Math 32 Advanced Calculus 1	3 units (lec)	Pre-requisite: Math 31
Advanced Calculus I is the first of two course that provides an introduction to mathematical analysis beyond the calculus series. Topics include the real number system, point set topology, limits and continuity, the derivatives, multivariable differential calculus, implicit functions and extremum problems.		
Math 33 Operations Research 1	3 units (lec)	Pre-requisite: Math 21
This course is an introduction to linear programming. It covers basic concepts, problem formulation, graphical solution for two-variable problems, duality and sensitivity analysis. In-class lectures and discussions are supplemented by computer hands-on sessions.		
Math 34 Differential Equations	3 units (lec)	Pre-requisite: Math 31
This is an introductory course in ordinary differential equations (ODEs). It focuses primarily on techniques for finding explicit solutions to linear ODEs. Topics include first order ordinary differential equations, linear differential equations, linear equations with constant coefficients nonhomogeneous equations, undetermined coefficients and variation of parameters, linear systems of equations; the existence and uniqueness of solutions.		
Math 35 Statistical Theory	3 units (lec)	Pre-requisite:
This course is an introduction to statistics and data analysis. It covers the following: reasons for doing Statistics, collection, summarization and presentation of data, basic concepts in probability, point and interval estimation, and hypothesis testing.		
Math 36 Probability	3 units (lec)	Pre-requisite: Math 31
This is an introductory in probability covering axiomatic probability space, discrete and continuous random variables, special distributions, mathematical expectations, conditional probability and independence, multivariate distributions, Laws of Large Numbers, and the Central Limit Theorem.		
Math 37 Graph Theory and Applications	3 units (lec)	Pre-requisite:
This is an introductory course of the theory of graphs and its applications. The topics include structure and symmetry of graphs, trees and connectivity, Eulerian and Hamiltonian graphs, planar graphs.		
Math 41 Complex Analysis	3 units (lec)	Pre-requisite: Math 32
This course involves a study of the algebra of complex numbers, analytic functions, elementary complex functions, complex integration, and the residue theorem and its applications.		
Math 42 Actuarial Mathematics	3 units (lec)	Pre-requisite: Math 31
Counting and combinatorics, probability, discrete random variables, discrete distributions, continuous random variables, continuous distributions, multivariate distributions, risk management concepts		
Math 43 Advanced Calculus 2	3 units (lec)	Pre-requisite: Math 32
Convergence of sequences and series of real numbers, sequences and series of functions, uniform convergence, power series, functions of bounded variation and rectifiable curves, Riemann-Stieltjes integrals, interchanging of limit operations, multiple integration, improper integrals, transformations.		
Math 44 Mathematical Statistics	3 units (lec)	Pre-requisite: Math 31
Probability spaces, random variables, distribution functions, independence of random variables, expectation, convergence, characteristic functions, strong law of large numbers and central limit theorem.		

Math 45 Numerical Analysis**3 units (lec)****Pre-requisite: Math 21, 34**

This is an introductory course that covers error analysis, solutions of linear and nonlinear equations and linear systems, interpolating polynomials, numerical differentiation and integration, numerical approximations of eigenvalues, and numerical solutions of ordinary differential equations.

Math 47 Topology**3 units (lec)****Pre-requisite: Math 32**

This course is an introduction to topology. It includes topics fundamental to modern analysis and geometry like topological spaces and continuous functions, connectedness, compactness, countability axioms, and separation axioms.

Math 48 Real Analysis**3 units (lec)****Pre-requisite: Math 32**

This course provides an introduction to measure and integration theory. It develops the theory of Lebesgue measure and integration over the real numbers. The course covers topics like the real number system, measurable functions, measurable sets, convergence theorems, integrals of simple and nonnegative measurable functions, and Lebesgue integral.

Math 49 Math Research 1**3 units (lec)****Pre-requisite:**

Production of research based on most recent developments in mathematics as published in math journals. All research titles must be with the approval of the research adviser and department chairman. (4th Year Level)

Math 52 Math Research 2**3 units (lec)****Pre-requisite: Math 49**