



UNIVERSITY OF THE EAST
Graduate School
Manila

Master of Science in Mathematics (MS Math)		
Core		
GMA 7101	Abstract Algebra I	3
GMA 7102	Advanced Linear Algebra I	3
GMA 7103	Real Analysis I	3
GMA 7104	Modern Complex Analysis	3
GMA 7105	General Topology	3
		15
Elective		
GMA 7201	Number Theory	3
GMA 7202	Set Theory and Logic	3
GMA 7203	Probability Theory	3
GMA 7204	Differential Equations	3
GMA 7205	Trends in Teaching Mathematics	3
GMA 7206	Graph Theory	3
GMA 7207	Algebraic Graph Theory	3
GMA 7208	Foundations of Data Science and Business Analytics	3
GMA 7209	Numerical Analysis	3
GMA 7300	Information Theory and Coding	3
GMA 7301	Mathematics in Population Biology	3
GMA 7302	Differential Geometry	3
GMA 7303	Theory of Groups and Rings	3
GMA 7304	Lie Algebra	3
GMA 7401	Special Topics in Mathematics	3
		12
GRR 7700	Comprehensive Examination	-
GRR 7980	Thesis 1	3
GRR 7990	Thesis 2	3
		6
		At least one (1) publication in refereed journal or juried creative work.
Total		33

* Approved by the University of the East Board of Trustees on February 18, 2016, initial offering in the First Semester 2016-2017.

CORE

GMA 7101 Abstract Algebra 1

Groups and their elementary properties, subgroups, cyclic groups, permutation groups, homomorphisms, Lagrange theorem, quotient groups, Sylow theorem and other fundamental abstract algebraic structures (3 units)

GMA 7102 Advanced Linear Algebra 1

Vector spaces, subspaces, bases, dimensions, linear transformations and their matrix representations, eigenvectors, eigenvalues and determinants (3 units)

GMA 7103 Real Analysis 1

Real-valued functions, metric spaces, and their properties, measure theory and Lebesgue integration (3 units)

GMA 7104 Modern Complex Analysis

Complex numbers, complex plane, analytic functions, Cauchy-Riemann equations, formal power, complex differentiation and integration, singularities, residue theory and their applications (3 units)

GMA 7105 General Topology

Basic topological concepts like sets, metric spaces, topological spaces, continuous mappings and their properties (3 units)

ELECTIVE

GMA 7201 Number Theory

Theory of numbers, including well-ordering property, mathematical induction, divisibility, prime numbers, congruence relations, quadratic reciprocity and quadratic forms, arithmetic functions, Diophantine equations, Pythagorean triples and simple continued fractions (3 units)

GMA 7202 Set Theory and Logic

Classes of sets, functions, relations, partial ordering, ordinal numbers and the development of mathematical thought through basic logical structures (3 units)

GMA 7203 Probability Theory

Events, event spaces, probability spaces, random variables and distributions, probability mass functions, probability density functions, cumulative generating functions, moment generating functions, law of large numbers, central limit theorem, and their application to statistics and stochastic processes (3 units)

GMA 7204 Differential Equations

Intermediate and advanced topics on differential equations, including Laplace transforms, matrix exponentials, ordinary differential equations, and partial differential equations (3 units)

GMA 7205 Trends in Teaching Mathematics

Selected topics that reflect current trends in teaching and the underlying theory behind them (3 units)

GMA 7206 Graph Theory

Graphs, sub graphs, trees, colourings, and their combinatorial properties, with applications to networks and algebra (3 units)

GMA 7207 Algebraic Graph Theory

Investigate the beautiful connection between algebra and graph theory; uses algebraic techniques to study combinatorial properties of graphs and vice versa, with emphasis on the study of highly-regular graphs (Prerequisite: GMA 712, 3 units)

GMA 7208 Foundations of Data Science and Business Analytics

The interdisciplinary nature of data science, concepts, techniques, with application to large data and business processes (3 units)

GMA 7209 Numerical Analysis

Solutions of ordinary differential equations and nonlinear differential equations by numerical methods; solutions of partial differential equations; finite difference method and finite element method (3 units)

GMA 7300 Information Theory and Coding

Basic concepts in information theory, including important theorems, and their applications to coding and cryptography (Prerequisite: GMA 712, 3 units)

GMA 7301 Mathematics in Population Biology

Population biology models in the form of ordinary differential equations with focus on their formulation, simulation, and mathematical analysis; includes theory of linear difference equations and systems applied to population growths, nonlinear difference equations, some discrete spatial models, single species models, chemostat and its basic mathematical properties, population dynamics, and a brief introduction to stochastic birth and death processes and delay models (3 units)

GMA 7302 Differential Geometry

Intermediate and advanced topics on differential geometry, with specific applications to Einstein's theory of relativity (3 units)

GMA 7303 Theory of Groups and Rings

Designed for students with background in the methods and concepts of abstract algebra and covers the theory of groups, different kinds of groups—groups of real and complex, the symmetric groups the group of Mobius transformations, cyclic groups, finite groups and abelian groups and the theory of rings including ideals and homomorphisms, subdirect sums, endomorphisms, linear transformations, the Jacobian radical, and other important topics (Prerequisite: GMA 711, 3 units)

GMA 7304 Lie Algebra

Theory of finite-dimensional Lie algebras and their connection to different branches of mathematics, including algorithms for construction of structural constants, derived algebras and their representations (3 units)

GMA 7401 Special Topics in Mathematics (3 units)

GRR 7700 Comprehensive Examination

Pre-requisite: Completion of all course work (0 units)

GRR 7980 Thesis 1

Selection and presentation of research topic, writing and oral defense of research proposal (3 units; Prerequisite: GRR 7700 Comprehensive Examinations)

GRR 7990 Thesis 2

Conducting, writing and oral defense of master's thesis approved in Thesis 1 (3 units; Prerequisite: GRR 7980 - Thesis 1)

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