UNIVERSITY OF ST. LASALLE

BACHELOR OF SECONDARY EDUCATION
Major in Mathematics

Program Description

The Bachelor of Secondary Education major in Mathematics program is designed to equip learners with adequate and relevant competencies to teach Mathematics in the secondary level. It aims to develop highly motivated and competent Mathematics teachers specializing in the content and pedagogy for secondary education.

Program Educational Objectives:

Within three to five years after obtaining a bachelor's degree in secondary education Major in Mathematics graduates are expected to:

1. Demonstrate mastery of content and research- based knowledge and its application within and across curriculum areas along with a sound and critical understanding of the application of theories and principles of teaching and learning and the ability to translate curriculum content into relevant learning activities.
2. Display proficiency in Mother Tongue, Filipino and English in the teaching and learning process and needed skills in the use of communication strategies, teaching strategies, assessment tools and strategies, and ICT to promote high quality learning outcomes.
3. Establish learning environments that are safe, secure, fair, and supportive to engage learners in meaningful activities, and responsive to learner diversity.
4. Manifest life-long commitment to improve practice through active participation in professional networks, engagement in research and extension, and postgraduate studies.
5. Uphold professional ethics, accountability and transparency to promote professional and harmonious relationships with learners, parents, colleagues, superiors, and the wider community as well as manifest understanding and application of the Lasallian principles of education in their practice.

Program Outcomes

By the time of graduation, the students of the program shall have develop the ability to:

1. Display skills and abilities to be a reflective and research-oriented life-long learner capable of articulating and syn-thesizing new knowledge in the specific field of practice
2. Articulate thoughts and ideas effectively and responsibly, in English and in Filipino, in both spoken and written modes, for various purposes and audiences
3. Work effectively and collaboratively with colleagues in a mul-ticultural environment by maintaining respect of individual differences to sustain a Christian working relationship, real-izing the Lasallian mission
4. Act in recognition of professional, social, and ethical re-sponsibility in a Lasallian way, through establishing smooth interpersonal relationships with others by taking responsibil-ity and accountability for actions, a positive attitude to-wards learning, and the concern for the preservation and protection of the environment
5. Engage collaboratively to preserve and promote Filipino his-torical and cultural heritage and to respect cultural diversity to contribute in the transformation of the community's situa-tion for the better
6. Articulate the rootedness of education in philosophical, so-cio-cultural,

historical, psychological, political, and Lasallian context in order to gain deeper understanding and wider perspectives of educational issues that have implications to students, society, environment, and Church

7. Facilitate learning using a wide range of teaching methodol-ogies including the responsible use of ICT in various deliv-ery modes appropriate to specific learners and their envi-ronment
8. Manifest mastery of subject matter/discipline and continued discovery of new knowledge by applying appropriate and relevant multidisciplinary approaches to problem solving tasks through technology and innovative methods
9. Develop innovative curricula, instructional plans, teaching approaches, and resources for diverse learners done through investigative skills alongside self-reflection
10. Apply innovative skills in the development and utilization of ICT to promote quality, relevant, and sustainable Christian educational practices significant to the society
11. Demonstrate a variety of thinking skills in planning, monitor-ing, assessing, and reporting learning processes and out-comes for the improvement of teaching-learning activities
12. Apply provisions of the Code of Ethics for Teachers vis-à-vis Lasallian Guiding Principles to come up with education-ally sound decisions and solutions that benefit the self, community, country and world
13. Pursue Continuing Professional Education (CPE) and deepen personal development to enrich the profession and make it useful to the church and society
14. Display in-depth knowledge of various mathematical con-cepts and procedures and are capable of synthesizing it across mathematics disciplines
15. Articulate mathematical thoughts and ideas effectively and confidently as applied to other curricular areas in different levels
16. Exhibit wide-range of knowledge of core concepts and ide-as in mathematics discipline so they be guided to synthesize various content significant to the learner so they can teach creatively confidently
17. Exhibit proficiency in designing and constructing flexible and effective assessment forms in mathematics utilized to be responsive to students' needs and developmental levels
18. Display skills and abilities in crafting routine and non-routine problems with different levels of complexity using technolo-gy and innovative methods so they can be efficient problem solvers
19. Apply innovative and time-tested methods for effective de-livery of mathematics instruction
20. Engage collaboratively in search of novel mathematical knowledge so they can be guided to synthesize and evalu-ate contents for wider use

UNIVERSITY OF ST. LA SALLE

SUMMARY OF REQUIRED COURSES in MATHEMATICS

	No. of Courses	Unit Equivalent	Total Units
General Education Courses			
Core Courses			
Understanding the Self	1	3	
Readings in Philippine History	1	3	
The Contemporary World	1	3	
Mathematics in the Modern World	1	3	
Purposive Communication	1	3	
Art Appreciation	1	3	
Science, Technology, and Society	1	3	
Ethics	1	3	24
Elective Courses			
Philippine Indigenous Communities	1	3	
Environmental Science	1	3	
Religions, Religious Experiences and Spirituality	1	3	9
Mandated Courses			
Life and Works of Rizal	1	3	
Physical Education	4	8	
National Service Training Program	2	6	17
Institutional Courses			
Religious Studies	2	6	
Group Guidance	1	1.5	
Public Speaking in the Discipline	1	3	
Logic	1	3	13.5
Professional Education Courses			
Foundation/Theories and Concepts			
The Child and Adolescent Learners and Learning Principles	1	3	
The Teaching Profession	1	3	
The Teacher and the Community, School Culture & Organizational Leadership	1	3	
Foundation of Special and Inclusive Education	1	3	12
Pedagogical Content Knowledge			
Facilitating Learner-Centered Teaching and Learning	1	3	
Assessment in Learning 1	1	3	
Assessment in Learning 2	1	3	
Technology for Teaching and Learning 1	1	3	
The Teacher and the School Curriculum	1	3	
Building and Enhancing New Literacies Across the Curriculum	1	3	18
Experiential Learning			
Field Study 1 (Observations Teaching-Learning in Actual School Environment)	1	3	
Field Study 2 (Participation and Teaching Assistantship)	1	3	
Teaching Internship	1	6	12
LET Preparatory Courses			
Intensive LET Preparatory Course 1 (General Education & Professional Education Courses)	1	3	
Intensive LET Preparatory Course 2 (Specialization)	1	3	6

Major Courses

History of Math	1	3	
College and Advanced Algebra	1	3	
Trigonometry	1	3	
Plane and Solid Geometry	1	3	
Logic and Set Theory	1	3	
Elementary Statistics and Probability	1	3	
Calculus 1 with Analytic Geometry	1	4	
Calculus 2	1	4	
Calculus 3	1	3	
Modern Geometry	1	3	
Mathematics of Investment	1	3	
Number Theory	1	3	
Linear Algebra	1	3	
Advanced Statistics	1	3	
Problem Solving, Mathematical Investigation and Modeling	1	3	
Principles and Strategies in teaching Mathematics	1	3	
Abstract Algebra	1	3	
Research in Mathematics	1	4	
Technology for Teaching and Learning (Instrumentation and Technology in Mathematics)	1	3	
Assessment and Evaluation in Mathematics	1	3	63
Total Units			**174.5**

UNIVERSITY OF ST. LASALLE

BACHELOR OF SECONDARY EDUCATION
Major in Mathematics

FIRST YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
RHIST	Readings in Philippine History	3	3	0	0	3	3
USELF	Understanding the Self	3	3	0	0	3	3
PCOM	Purposive Communication	3	3	0	0	3	3
IRS1	Lasallian Sprituality	3	3	0	0	3	3
PED1	Physical Education 1 (Wellness and Fitness)	2	2	0	0	2	2
NSTP1	National Service Training Program 1	3	3	0	0	3	3
ARTAP	Art Appreciation	3	3	0	0	3	3
EDCN101	The Child and Adolescent Learner and Learning Principles	3	3	0	0	3	3
EDCN102	Facilitating Learner-Centered Teaching	3	3	0	0	3	3
	Total	**26**	**26**	**0**	**0**	**26**	**26**

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
MATHMW	Mathematics in the Modern World	3	3	0	0	3	3
STS	Science, Technology, and Society	3	3	0	0	3	3
ENSCI	Environmental Science	3	3	0	0	3	3
RIZAL	Life and Works of Rizal	3	3	0	0	3	3
IRS2	Lasallian Formation on Christian Morality	3	3	0	0	3	3
PED2	Physical Education 2 (Team Sports and Rhythmic Activities)	2	2	0	0	2	2
IGG	Group Guidance	1.5	1.5	0	0	1.5	1.5
NSTP2	National Service Training Program 2	3	3	0	0	3	3
EDCN103	The Teaching Profession	3	3	0	0	3	3
EDCN104	Technology for Teaching and Learning 1	3	3	0	0	3	3
	Total	**27.5**	**27.5**	**0**	**0**	**27.5**	**27.5**

SECOND YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
PICO	Philippine Indigenous Communities	3	3	0	0	3	3
PED3	Physical Education 3 (Swimming and Recreation)	2	2	0	0	2	2
PSPEAK	Public Speaking in the Disciplines	3	3	0	0	3	3
EDCN105	Assessment in Learning 1	3	3	0	0	3	3
EDCN106	The Teacher and the School Curriculum	3	3	0	0	3	3
MAED201	College and Advanced Algebra	3	3	0	0	3	3
MAED202	Trigonometry	3	3	0	0	3	3
MAED203	Plane and Solid Geometry	3	3	0	0	3	3
MAED204	Logic and Set Theory	3	3	0	0	3	3
	Total	**26**	**26**	**0**	**0**	**26**	**26**

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
IRS3E	Religions, Religious Experiences and Spirituality	3	3	0	0	3	3
CWRLD	The Contemporary World	3	3	0	0	3	3
ETHICS	Ethics	3	3	0	0	3	3
PED4	Physical Education 4 (Individual and Dual Sports)	2	2	0	0	2	2
LOGIC	Logic	3	3	0	0	3	3
EDCN107	Assessment in Learning 2	3	3	0	0	3	3
EDCN108	The Teacher and the Community, School Culture & Organizational Leadership	3	3	0	0	3	3
MAED205	Elementary Statistics and Probability	3	3	0	0	3	3
MAED206	Calculus 1 with Analytical Geometry	4	4	0	0	4	4
	Total	**27**	**27**	**0**	**0**	**27**	**27**

THIRD YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
EDCN109	Foundation of Special and Inclusive Education	3	3	0	0	3	3
EDCN110	Building and Enhancing New Literacies Across the Curriculum	3	3	0	0	3	3
MAED207	Mathematics of Investment	3	3	0	0	3	3
MAED208	Number Theory	3	3	0	0	3	3
MAED209	Linear Algebra	3	3	0	0	3	3
MAED210	Advanced Statistics	3	3	0	0	3	3
MAED211	Calculus 2	4	4	0	0	4	4
MAED212	Research in Mathematics	4	4	0	0	4	4
	Total	**26**	**26**	**0**	**0**	**26**	**26**

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
MAED213	History of Math	3	3	0	0	3	3
MAED214	Problem Solving, Investigations and Modeling	3	3	0	0	3	3
MAED215	Abstract Algebra	3	3	0	0	3	3
MAED216	Calculus 3	3	3	0	0	3	3
MAED217	Modern Geometry	3	3	0	0	3	3
MAED218	Principles and Strategies in Teaching Math	3	3	0	0	3	3
MAED219	Technology for Teaching and Learning 2 (Instrumentation and Technology in Mathematics)	3	3	0	0	3	3
MAED220	Assessment and Evaluation in Mathematics	3	3	0	0	3	3
	Total	**24**	**24**	**0**	**0**	**24**	**24**

FOURTH YEAR

First Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
EDCN111	Field Study 1 (Observations Teaching -Learning in Actual School Environment)	3	3	0	0	3	3
EDCN112	Field Study 2 (Participation and Teaching Assistantship)	3	3	0	0	3	3
EDCN114	Intensive LET Preparatory Course 1 (General Education & Professional Education Courses)	3	14	0	0	3	3
	Total	**9**	**20**	**0**	**0**	**9**	**9**

Second Semester		Lec Units	# of hrs/wk	Lab Units	# of hrs/wk	Total Credit Units	Total Assessed Units
EDCN113	Teaching Internship	6	30	0	0	6	6
EDCN115	Intensive LET Preparatory Course 2 (Specialization)	3	7	0	0	3	3
	Total	**9**	**37**	**0**	**0**	**9**	**9**

MAJOR COURSE DESCRIPTIONS
Bachelor of Secondary Education
Major in Mathematics

MAED201 **3 units**
COLLEGE AND ADVANCED ALGEBRA
The course builds upon the student's knowledge on properties of the real number system, operations on different types of algebraic expression, and the solution of various types of equations and inequalities. The course also covers the prerequisites to trigonometry and calculus, specifically transcendental and non-transcendental functions, including the characteristics of their graphs and applications. The major learning outcome of this course includes the construction and presentation of different mathematical models representing solutions to real life problems.

The Lasallian math education students will experience an integrated learning of both the subject matter and pedagogical perspective that would develop their mastery of the subject matter, critical and creative thinking, effective communication, and sense of social responsibility as future math teachers. Teaching-learning activities should promote values necessary for productive participation in the world of work, the family, the community, the wider society and the local church. Include production of activity sheets relating to each major topic discussed in every term, accomplished solutions of problem sets, and micro-teaching of a chosen topic.

MAED202 **3 units**
TRIGONOMETRY
The course introduces students to circular and trigonometric functions, trigonometric identities, and to polar coordinate system. The students then apply concepts in these topics to applications in problem solving. This aims to prepare prospective secondary math teachers to teach trigonometry by equipping them with the necessary concepts and techniques to become effective and efficient teachers in the future.

Students are expected to exhibit critical thinking in deriving and applying basic trigonometric formulas, sketching the graph of other trigonometric functions, proving identities and solve trigonometric equations, graphing polar equations, and solving complex numbers.

MAED203 **3 units**
PLANE & SOLID GEOMETRY
The course covers topics on Euclidean Geometry. The topics are discussed using both the deductive and inductive methods to conjecture definitions, corollaries, postulates and theorems on plane and solid geometry.

The students will experience an integrated learning of both the subject matter and pedagogical perspective that would develop their mastery of the subject matter, effective communication, and sense of social responsibility as future math teachers. Includes accomplished activity sheets relating to subject matter, construction of self-made teaching-learning activities for high school geometry, and a micro-teaching of a chosen topic. Classroom activities provide experiences that promote positive sense of values and good dispositions for planning and decision -coherent to social responsibilities as Christians in preparation to the actual work of teaching. Complete solutions to the problem sets, creation of models of different polyhedrons, and a micro-teaching of a chosen topic.

MAED204 **3 units**
LOGIC AND SET THEORY
The course is a study of mathematical logic which covers topics such as propositions, logical operators, rules of replacement, rules of inference, algebra of logic and quantifiers. It also includes a discussion of elementary theory of sets such as fundamental concepts of sets, set theorems and set operations.

MAED205 **3 units**
ELEMENTARY STATISTICS & PROBABILITY
The course equips the students with the basic statistical tools to understand various phenomena. the topics on mean, variance, sampling, and estimation eventually allow the students to be able to perform hypothesis testing in real life problems from different fields. The course includes applications and data analysis with computations carried out using SPSS.

The teaching-learning activities should also prepare future Lasallian teachers to become critical thinkers, effective communicators, and socially responsible Christians as they apply their learned knowledge, skills and attitude to the betterment of the society, family, and the wider world and Church. Final requirements include a simple descriptive research paper and a group presentations of research findings and recommendations anchored in socially responsible Christian perspectives.

MAED206 **4 units**
CALCULUS I WITH ANALYTIC GEOMETRY
The course equips the students with knowledge and skills needed to be able to determine limits of functions, to differentiate, and to integrate algebraic, exponential, logarithmic, and trigonometric functions in one variable. It also includes exposure to more challenging problems covering continuity and areas of regions.

This subject matter should help the Lasallian math education students on how to translate their knowledge into actual teaching practice for the betterment of society; and prepare them to be socially responsible in the world of work, the family, the community, the wider society and the

local Church. It includes submission of completed problem sets, and compendium of different articles in the field of calculus and its application.
Prerequisites: MAED201-College and Advanced Algebra, MAED202- Trigonometry, MAED203-Plane and Solid Geometry

MAED207 **3 units**
MATHEMATICS OF INVESTMENT
The course introduces students with a basic understanding of the applications of mathematical concepts and skills in economics, business and accounting. It includes determining the time value of money using simple and compound interest and discounting, variation of annuities, amortization, stocks and bonds, and sinking fund.
Prerequisite: MAED201-College and Advanced Algebra

MAED208 **3 units**
NUMBER THEORY
The course is a study of the properties of numbers and their proofs. It presents the students with different methods of mathematical proving. it focuses on the discussion of the set of integers that including Unique Prime Factorization, Divisibility Rules, Euclidean Algorithm, Linear Congruencies and Linear Diophantine Equations. Completion of the activity sheets and problem sets, and compendium of practical application of the different theorems relating to the subject matter.
Prerequisites: MAED201-College and Advanced Algebra, MAED204-Logic and Set Theory

MAED209 **3 units**
LINEAR ALGEBRA
This course provides a basic understanding of vector spaces, including the study of matrices, their properties and matrix operations. it also covers the application of matrices in systems of linear equations and linear transformations. Students will read, interpret, and use the vocabulary, symbolism and basic definitions used in linear algebra, including vectors, matrices, vector spaces, subspaces, linear independence, span, basis, dimension, linear transformation, inner product, Eigenvalue, and Elgenvector.

Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring linear algebra as a prerequisite or for work in occupational fields requiring a background in linear algebra. These fields include the physical sciences and engineering as well as mathematics.
Prerequisite: MAED204-Logic and Set Theory

MAED210 **3 units**
ADVANCED STATISTICS
The course deals with non-parametric statistics. It covers the topics on test of association such as Spearman Rho, Phi coefficient, contingency coefficient, bi-serial and test of differences such as Mann-Whitney U, Wilcoxon. It includes applications and data analysis with computations carried out using SPSS.

The students are required in more advance research paper compared to the previous elementary statistics class, and presentation of the results and recommendations anchored in our own cultural and social contexts and Christian moral principles.
Prerequisite: MAED205-Elementary Statistics and Probability

MAED211 **4 units**
CALCULUS II
The course aims to further develop the students' understanding of differential and integral calculus. It covers the methods and techniques of integration, indeterminate forms, and improper integrals of algebraic and transcendental functions.

Students are expected to exercise critical thinking in deriving and using concepts of integral calculus and applying it to other areas of mathematics and in practical life situations thereby appreciating its power, variety and creativity through board work activities, small groupings, problem sets, and illustrative examples.
Prerequisites: MAED206-Calculus I with Analytic Geometry

MAED212 **4 units**
RESEARCH IN MATHEMATICS
This course aims to prepare prospective mathematics teachers to undertake an undergraduate research project. It gives them the opportunity to conduct researches that address the problems, issues, and concerns in mathematics teaching and learning. It also showcases their research skills through the application of the mathematical content and processes they have learned previously.

MAE213 **3 units**
HISTORY OF MATH
The course presents the humanistic aspects of mathematics which provides the historical context and timeline that led to the present understanding and applications of the different branches of mathematics. They will be required to showcase different historical facts in mathematics in different ages through a construction of a mini-museum called, Mathemuseum. Constructivist learning experiences provide opportunities for a holistic development that would cater the need in becoming a socially responsible Christian.

MAED214 **3 units**
PROBLEM SOLVING, MATHEMATICAL INVESTIGATION & MODELING
The course deepens and further enhances the students' understanding of real-life applications of mathematics through investigating, pattern finding, testing, and justifying conjectures, and making generalizations.

Students are expected to demonstrate and exhibit skills, concepts, and processes that enable complex thought, construct questions, forge connections and deepen meaning, evaluate the soundness

and relevance of information and reasoning, exploring mathematical ideas and problem solving using tools such as graphing calculators, Winplot. Mathematical, or Excel, recognize, pursue, and explain substantive connections within and among areas of knowledge class to learn and solve problems but produce their own work for assessment.
Prerequisites: MAED201-College and Advanced Algebra, MAED203-Plane and Solid Geometry, MAED204-Logic and Set Theory

MAED215 3 units
ABSTRACT ALGEBRA
The course is a study of basic algebraic structures such as groups, rings, integral domains and fields. It provides a basic understanding of relations focusing on isomorphism. it aims to enhance the students' skills in constructing mathematical proofs, and develop their symbolic thinking and appreciation of mathematical structures.

The teaching-learning activities should allow the Lasallian math education students to experience critical thinking and appreciation of the higher mathematical order through its applications in a variety of diverse fields including computation. It also includes submission of answered problem sets, and a conceptualized structure of value system observed from a community that resembles characteristics of a group, ring or field.
Prerequisite: MAED204-Logic and Set Theory

MAED216 3 units
CALCULUS III
The course aims to provide the students with an understanding of the application of differentiation and integration in sequences, infinite series, power series, as well as of multiple integration for functions in several variables. Moreover, students will be able to apply these concepts to problems solving.
Prerequisite: MAED211-Calculus II

MAED217 3 units
MODERN GEOMETRY
The course is an enrichment of the course on Euclidean Geometry. It discusses the properties and applications of other types geometries such as infinite geometry, non-Euclidean geometry, and projective geometry.

Students will present problem set outputs and concepts in hyperbolic geometry using the geometer sketch pad (GSP) or winplot (mathematical software) and they will prepare and facilitate teaching-learning activities for the class using the GSP or winplot.
Prerequisites: MAED203-Plane and Solid Geometry, MAED204-Logic and Set Theory

MAED 218 3 units
PRINCIPLES AND STRATEGIES IN TEACHING MATH
The course deals with the applications of the principles, the strategies in teaching, and philosophical foundations of teaching mathematics. These are then applied in lesson planning and microteaching.

MAED219 3 units
TECHNOLOGY FOR TEACHING AND LEARNING 2 (INSTRUMENTATION AND TECHNOLOGY IN MATHEMATICS)
This is a course which focuses on the application, design, production, utilization, and evaluation of information and Communications Technology (ICT) materials for teaching and learning Mathematics Education Programs.

The major requirement for this course is an ICT-integrated and project-based learning plan aligned to the K to 12 curriculum. All the learning activities and course requirements will revolve around the student-teacher developed learning plan.
Prerequisite: EDCN104-Technology for Teaching and Learning 1

MAED220 3 units
ASSESSMENT AND EVALUATION IN MATHEMATICS
The course deals with traditional and authentic assessment methods for evaluating mathematics learning. It covers the purposes of instruction and assessment, the relationship of assessment to content and performance standards, and discussions on the issues and trends in assessment specifically in mathematics teaching.