



# BACHELOR OF SCIENCE IN MATHEMATICS AND APPLIED MATHEMATICS (HONOURS)

[R/0541/6/0006] 03/28 [MQA/FA9536]

DURATION	INTAKE	MEDIUM OF INSTRUCTION
3 years	February/ April/ September	English

## ABOUT THE PROGRAMMES

The Mathematics and Applied Mathematics programme in XMUM is offered by the Department of Mathematics and Applied Mathematics since September 2018. The department hosts mathematicians who graduated from well-known institutes across the globe. Their expertise ranges from analysis, algebra, geometry, financial mathematics to statistics. Catering to the needs of students, the department assures the courses offered are on a par with the best in the world, so that the students can appreciate the beauty and applications of mathematics.

What are our strengths? First, we emphasise a rigorous and clear understanding of mathematical theories. Our graduates learn to structure their arguments logically and present ideas persuasively. By connecting abstract concepts to real-world applications, we ensure that students can bridge the gap between theory and practice.

Second, our programme offers a broad selection of electives, ranging from pure and applied mathematics to physics, computer science, finance, and business. This flexibility allows students to explore their secondary interests and prepare for interdisciplinary careers. With our comprehensive three-year curriculum, graduates are well-equipped to pursue advanced studies or enter the workforce confidently.

Next, the programme focuses on cultivating essential skills such as logical thinking, analytical reasoning, problem-solving, and creativity. These qualities are highly sought after in diverse career paths, ensuring our graduates are competitive and versatile professionals.

Finally, the department offers personalised support through an advisor-advisee system that guides students throughout their university journey. To foster a lively academic environment, the department's student council organises regular workshops to further improve students' skills and knowledge outside of the class. Research seminars are also conducted by faculty members or invited researchers to present cutting-edge research at the frontier of mathematics.

At XMUM, we are committed to nurturing a new generation of mathematicians who will thrive in their pursuits and contribute meaningfully to society. Whether your passion lies in theoretical exploration or practical application, this programme provides the perfect foundation for success.

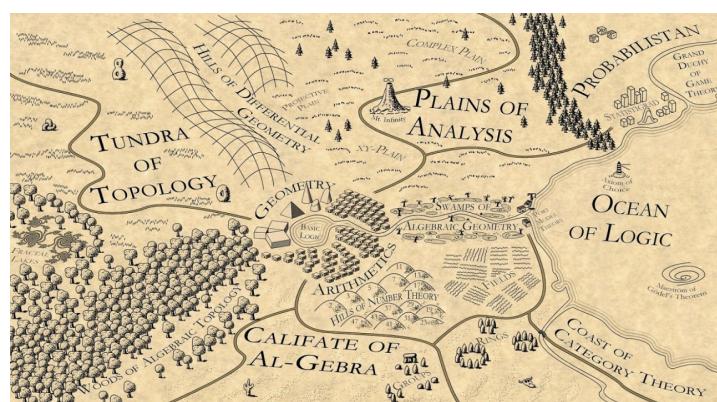
## PROGRAMME HIGHLIGHTS

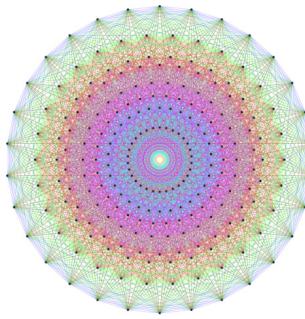
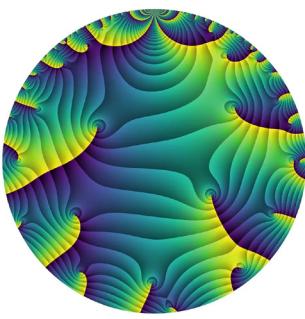
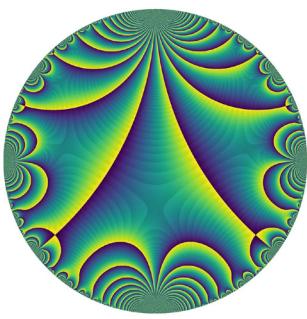
- ▶ Benchmarking our course structures at an international level.
- ▶ Focus on theories behind mathematics and their applications.
- ▶ Provide a variety of elective courses ranging from pure mathematics and applied mathematics to physics, computer science, statistics, finance and business.
- ▶ Empower graduates with rigorous mathematical foundations before venturing into the workplace or pursuing postgraduate study.
- ▶ Equip graduates with strong logical thinking skills, analytical skills, problem-solving skills and creative thinking skills.

## CAREER OPPORTUNITIES

(Based on graduate surveys)

- Mathematician/Researcher
- Lecturer/Teacher/Tutor
- Computer Scientist
- Data Scientist
- Financial/Marketing/Business Analyst
- Accounting Assistant
- Bank Manager
- Logistician
- Risk Management Executive
- Sales Executive





*"Do you like numbers? Do you love geometry? Or is analysing structures your hobby? Rooted in logic, mathematics connects ideas and clarifies the world around us."*

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### ENTRY REQUIREMENTS

\*For other equivalent qualifications, please consult our programme counsellor

STPM	A pass in STPM with at least Grade B- (GP 2.7) in 2 subjects including Mathematics
A-LEVEL	A pass in A-Level with at least a Grade B in 2 subjects including Mathematics
UEC	A pass in UEC with at least a Grade B in 5 subjects including Advanced Mathematics
Foundation/Matriculation	A pass in Foundation / Matriculation with at least CGPA 2.0 out of 4.0 including a Grade B in Mathematics
Diploma	A pass in Diploma with at least CGPA 2.5 out of 4.0 including a Grade B in Mathematics

### MAIN COURSES

#### YEAR 1

- Calculus I, II
- Linear Algebra I, II
- Discrete Mathematics
- Algebra and Analytic Geometry
- Ordinary Differential Equations
- Probability Theory
- Python Programming Language

#### YEAR 2

- Mathematical Analysis I, II
- Abstract Algebra I: Group and Ring Theory
- Complex Analysis
- Statistics
- Major Electives (Choose 3)

#### YEAR 3

- Final Year Project
- Industrial Training
- Major Electives (Choose 6)

#### Major Electives

##### MATH SUBJECTS

- Abstract Algebra II: Field Extensions and Galois Theory
- Advanced Linear Algebra
- General Topology
- Dynamical System
- Combinatorics
- Partial Differential Equations
- Differential Geometry of Curves and Surfaces
- Real Analysis
- Analysis and Manifolds
- Algebraic Topology
- Analytic Number Theory
- Classical Algebraic Geometry
- Algebraic Number Theory
- Stochastic Processes
- Numerical Analysis
- Regression Analysis
- Time Series
- Financial Mathematics I, II, III
- Bayesian Statistics
- Multivariate Statistical Analysis
- Data Analysis

##### NON-MATH SUBJECTS

- Mechanics
- Quantum Mechanics I,II
- Electrodynamics I,II
- Thermodynamics and Statistical Physics
- Solid State Physics
- Astrophysics and Cosmology
- Nuclear and Particle Physics
- Theory of Relativity
- C and C++ Programming
- Principles of Artificial Intelligence
- Computer Architecture
- Operating Systems
- Database
- Big Data Analytics
- Data Structure
- Digital Logic
- Design and Analysis of Algorithms
- Monetary Policy and Financial Supervision
- Risk Management
- Global Logistics and Supply Chain Management
- Principles of Accounting
- Microeconomics
- Macroeconomics
- Principles of Finance

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