MATHEMATICAL SCIENCES

Postgraduate
- Prospectus -
2024

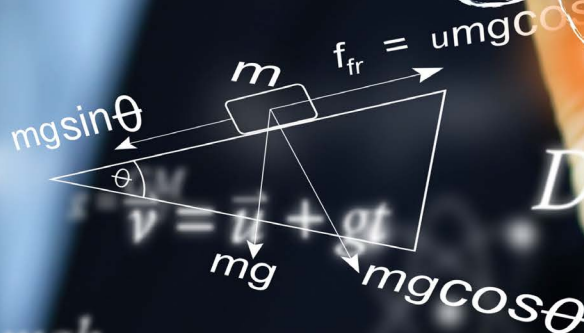**SUNWAY UNIVERSITY**
A Class Above

$$E = mc^2$$

$$s = ut + \frac{1}{2} gt^2$$

$$f_{fr} = umg\cos\theta$$

$$mg\sin\theta$$

$$\nu = \vec{u} + gt$$

$$mg$$

$$mg\cos\theta$$

$$Ep = mgh$$

$$D = \sqrt{\frac{4Qv}{\pi U v}}$$

$$\frac{1}{2} mv^2$$

$$Ep = mgh$$

$$E_k = \frac{1}{2} mv^2$$

$$E_{p_E} = \frac{1}{2} kx^2$$

$$\sum F = ma$$

$$g = \frac{GM}{r^2}$$

CONTENTS

CONTACT:

SUNWAY UNIVERSITY DU025 (B)
Owned and governed by the Jeffrey Cheah Foundation
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info@sunway.edu.my

+6 (03) 7491 8622

SunwayUniversity   @SunwayU

SUNWAY IS ONE OF THE TOP 150 UNIVERSITIES IN THE WORLD UNDER 50 YEARS OLD

As one of Malaysia's leading and internationally recognised private universities, Sunway University is positioned amongst top universities in the world by QS World University Rankings. Sunway University is ranked #586 globally in the QS World University Rankings 2024 and is the #1 non-government linked private university in Malaysia in the Times Higher Education World University Rankings 2023.

Sunway University has been awarded #1 in Graduate Employability among all universities in Malaysia by Talentbank Group for two consecutive years (2022, 2023) through the National Graduate Employability Index.

The University emerged as an Overall 5 Star rated (Excellent) institution in the QS Stars University Ratings, as well as Five-Star ratings for the individual categories: teaching, facilities, employability, social responsibility, inclusiveness, academic development and internationalisation.

Collaborating with world class partners - Lancaster University and Le Cordon Bleu International, Sunway University offers premier education with international repute. The University also partners University of Oxford, University of Cambridge, Harvard University, Massachusetts Institute of Technology and University of California, Berkeley.

MALAYSIA'S #1
NON-GLU* PRIVATE UNIVERSITY
as awarded by
Times Higher Education

THE **World University Rankings 2024**

*Government-Linked University

IN THE TOP **600** IN THE WORLD
2024

TEACHING
EMPLOYABILITY
FACILITIES
SOCIAL RESPONSIBILITY
ACADEMIC DEVELOPMENT
INTERNATIONALISATION
INCLUSIVENESS

EXCELLENT
★★★★★
QS

WHY STUDY AT SUNWAY UNIVERSITY?

**Industry-relevant and job-ready** programmes and curriculum

Numerous **research centres and research collaborations** with leading international universities
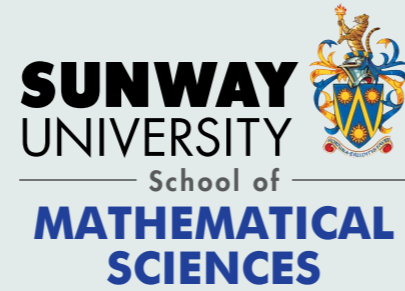
Abundant **networking opportunities** with renowned lecturers, distinguished research supervisors and industry experts

Flexible **full-time and part-time** study modes to accommodate your schedules

INTRODUCTION

SUNWAY UNIVERSITY
School of
MATHEMATICAL SCIENCES
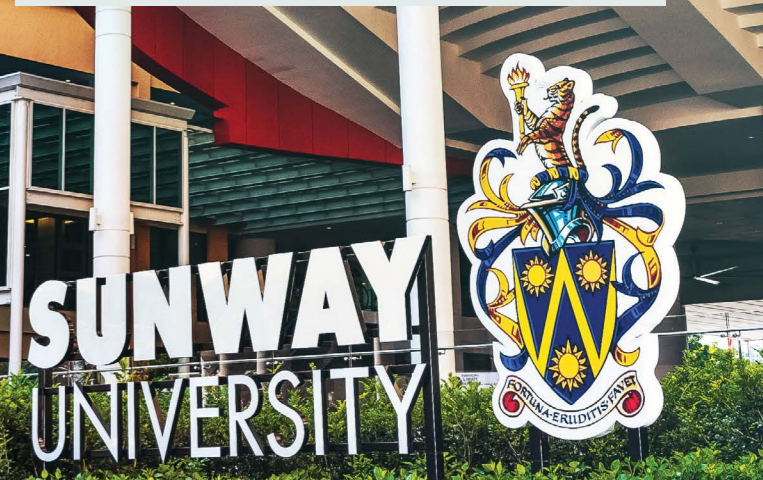
The School of Mathematical Sciences in Sunway University houses researchers from various backgrounds and undertake research in diverse topics across actuarial science, mathematics and statistics. The School has three home-grown postgraduate programmes:

Postgraduate Taught Programme:
1. Master of Science in Applied Mathematics

Postgraduate Research Programme:
1. Master of Science in Mathematical Sciences
2. Doctor of Philosophy in Mathematical Sciences

HOW TO APPLY

PROGRAMME	APPLICATION CHECKLIST	CONTACT
Master of Science in Applied Mathematics	Kindly email the following documents for an eligibility check: • Curriculum Vitae • Bachelor's/Master's degree transcript • Completion certificate • Statement of Research Interest	mam_sms@sunway.edu.my
Master of Science in Mathematical Sciences		mma_sms@sunway.edu.my
Doctor of Philosophy in Mathematical Sciences	After passing the eligibility check, the school administrator will brief the student further regarding the application process.	pma_sms@sunway.edu.my

STATEMENT OF RESEARCH INTEREST
(for applicants of Master of Science in Mathematical Sciences and Doctor of Philosophy in Mathematical Sciences)
The statement of research interest covers the following structure:

• Working Title
• Nature of the research that interest you and why
• Research objectives
• Literature review
• Research Methodology
• References to anything you have read relevant to this research area

SCHOLARSHIPS & BURSARIES

For more information regarding available scholarships and bursaries, please refer to
https://scholarship.sunway.edu.my/scholarships/academic-excellence-scholarships

Terms and Conditions apply

ENTRY REQUIREMENTS

| PROGRAMME	ENTRY REQUIREMENTS	ENGLISH LANGUAGE REQUIREMENTS
Master of Science in Applied Mathematics	(i) A Bachelor's degree in the field or related fields in mathematics, applied mathematics, engineering, computing, or actuarial science with a minimum CGPA of 2.50 out of 4.00 or equivalent, as accepted by the HEP Senate; or (ii) A Bachelor's degree in the field or related fields in mathematics, applied mathematics, engineering, computing, or actuarial science with a minimum CGPA of 2.00 and not meeting a CGPA of 2.50, can be accepted subject to rigorous internal assessment. (iii) Candidates without a qualification in the related fields or working experience in the relevant fields must undergo appropriate prerequisite courses as determined by the institution and meet the minimum CGPA based on (i) and (ii). • Any other qualifications will be considered on a case-by-case basis.	
Master of Science in Mathematical Sciences	(i) A Bachelor's degree in mathematical sciences or related fields with a minimum CGPA of 2.75 or equivalent; or (ii) A Bachelor's degree in the mathematical sciences or related fields with a minimum CGPA of 2.50 and not meeting CGPA of 2.75, can be accepted subject to rigorous internal assessment (Interview and Portfolio Write-Up); or (iii) A Bachelor's Degree in mathematical sciences or related fields with a minimum CGPA of 2.00 and not meeting CGPA of 2.50, can be accepted subject to a minimum of five years working experience in the relevant field and rigorous internal assessment (Interview and Portfolio Write-Up); or (iv) Candidates without a qualification in the related fields or relevant working experience must undergo appropriate prerequisite courses determined by the institution and meet the minimum CGPA based on (i) to (iii) of the entry requirement. • Any other qualifications will be considered on a case-to-case basis.	IELTS : 6.0 or equivalent*
Doctor of Philosophy in Mathematical Sciences	• A Master's degree in mathematical sciences or related fields. • Any other qualifications will be considered on a case-to-case basis.	

* Candidates who have completed a Bachelor's degree and Master's degree (if applicable) in English would have met the language requirements. All international applicants must get approval from our International Office on English eligibility (IELTS/TOEFL) / exemption (if applicable) regardless of whether the medium of instruction in the previous degree is English or not.

MASTER OF SCIENCE IN APPLIED MATHEMATICS

DURATION

Full-time – 1 year
Part-time – 2 years
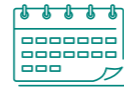
INTAKES
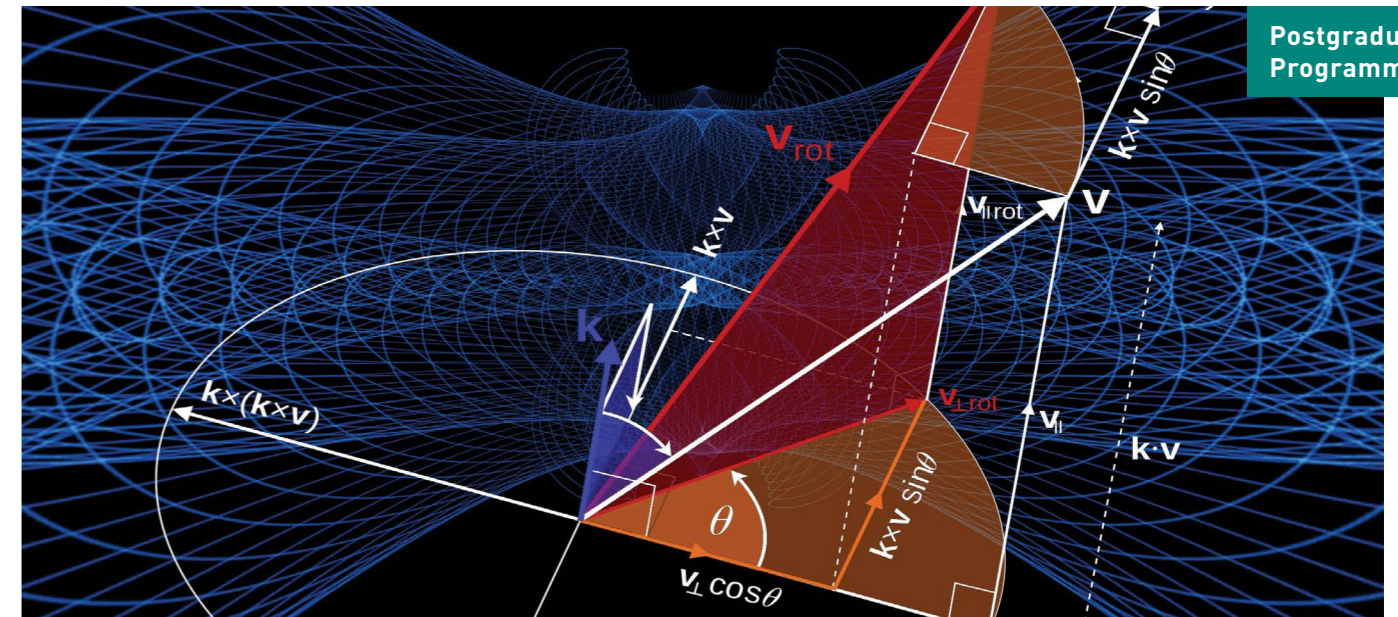
January, March, May, July, September

TAUGHT PROGRAMME

The Master of Science in Applied Mathematics is an interdisciplinary field that focuses on the application of mathematics, statistics, and computational methods to intelligently model and describe the behaviour of real world's complex systems that are frequently encountered in diverse field, such as manufacturing, agriculture, healthcare & medicine, advanced technology, logistics and supply chain, operations research, data science, risk management, education, natural sciences, biomedical sciences, engineering, finance, and the social sciences.

This taught master degree aims to equip students with the latest knowledge in optimisation, optimal control, machine learning, mathematical modelling, simulation and mathematical and statistical techniques which are important tools in solving sophisticated problems constantly faced by businesses, industries, companies and governments, due to the ever-evolving and volatile environment.

Modules included in this programme must therefore be the most relevant in trying to address the on-going development and potential future impact of unpredictable global events; and they include unconstrained and constrained optimisation, optimal control, discrete and combinatorial optimisation, network design and analysis, mathematical modelling, computational and numerical methods, statistics and applied probability, control and systems theory and operations research.

By embracing new mathematical methods and techniques, students who complete this programme shall develop and gain worthy transferable skillset and this will open up abundant opportunities for a fulfilling and lucrative career as an applied mathematician in the many industries mentioned above.

CAREER PROSPECTS

- AI Development Analyst
- Computational Analyst
- Computer Programmers
- Data Encryption Coding Analyst
- Digital Modelling Scientist
- Economic Analyst
- Environmental Scientist
- Financial Analyst
- Machine Learning Analyst
- Medical Modelling Scientist
- Neural Network Scientist
- Operations Research Analyst
- Policy Modelling Scientist
- Predictive Modelling Scientist
- Risk Management Consultant
- Statistical Analyst
- Supply Chain Analyst

PROGRAMME STRUCTURE

- Graphs & Network
- Machine Learning
- Optimisation Techniques
- Predictive Models and Clustering Algorithms
- Research Methodology
- Research Project I
- Research Project II
- Scientific Programming

Electives (Choose 2)
- Applied Combinatorics
- Applied and Computational Dynamical Systems
- Control Theory
- Mathematical Modelling in Production Systems
- Numerical Analysis with Applications
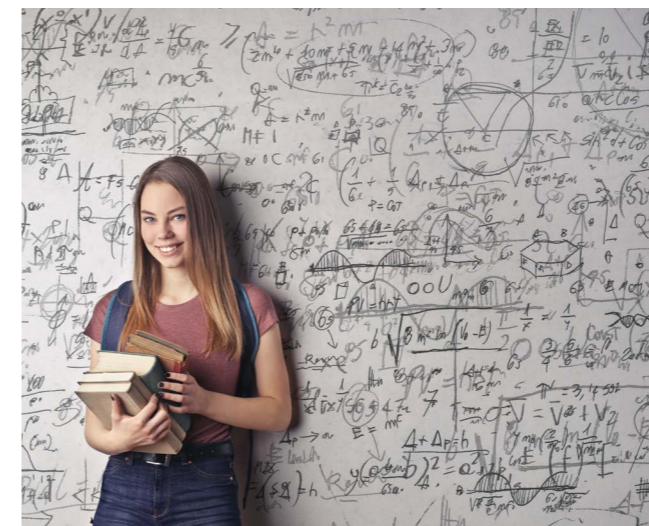- Optimal Control

AREAS OF RESEARCH

The School has a team of dedicated academic staff who will mentor and guide you with possible research project topic in the following areas of research interests, but not limited to:

- Big Data Analytics
- Combinatorics
- Computational Fluid Dynamics
- Graph Theory
- Mathematical Modelling
- Multivariate Analysis
- Neural Networks
- Numerical Optimisation
- Optimal Control
- Optimal Control Computation
- Optimisation
- Simulation
- Statistical Modelling
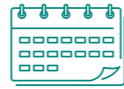- Statistical Quality Control

CONTACT

For more information, please email
mam_sms@sunway.edu.my

MASTER OF SCIENCE IN MATHEMATICAL SCIENCES

DURATION

Full-time - 2 years
Part-time - 3 years

INTAKES

January and July

RESEARCH PROGRAMME

The Master of Science in Mathematical Sciences covers a broader scope in research areas of mathematical sciences, embedding the most urgent and current issues faced in the various fields of mathematics.

This programme will develop the following graduate attributes which are in sync with and support the mission of the university:

1. highly employable graduates who are knowledgeable and technically competent in various fields of mathematics and statistics;

2. graduates with the mathematical and analytical skills with competencies in critical thinking and problem solving;

3. graduates with managerial and entrepreneurial skills to be able to communicate effectively;

4. graduates who are ethical and responsible with expertise in mathematical and statistical knowledge;

5. graduates who recognise the need to engage in life-long learning for personal and professional growth and development;

The Master of Science in Mathematical Sciences programme empowers students with a competitive edge in research through in-depth training mediated by experts. As a postgraduate student, you will be integrated as members of our research groups at Sunway University with various opportunities to participate in research alongside supervisors through seminars, workshops, laboratory and field work.
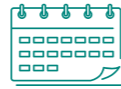
CAREER PROSPECTS

- Professional activities in academic institutions and research Institutes
- IT services
- Finance services and investment management firms
- Manufacturing industry
- Consultancy firm
- Education

PROGRAMME STRUCTURE

Candidates are required to complete **two modules**, in addition to the thesis component.

- **Research Methodology**
  In this module, you will have an opportunity to examine research designs with methodology as well as data analysis techniques employed by researchers. At the end of this module, you will be expected to formulate and submit a proposal for research in an area of your own interest or specialisation.

  Students are required to attend 2 hours of class per week on a weekday, for a duration of 14 weeks.

- **Directed Readings**
  In this module, you will learn to review the main research topics within a chosen field of study and appraise current key research activities related to the chosen research topic.

Thesis
The Master of Science in Mathematical Sciences is awarded based on the successful completion of a thesis. The thesis should demonstrate proficiency, criticality and mastery in the subject or chosen area of research.

AREAS OF RESEARCH

The School has a dedicated team of academicians who will mentor and discuss possible research topics with you in the following areas of research interests, but not limited to:

- Applications of statistics in finance and insurance
- Applied econometric
- Applied probability
- Applied stochastic processes
- Big data analytics
- Combinatorics
- Computational fluid dynamics
- Credit risk modelling
- Evolutionary computation
- Graph theory
- Linear and multilinear algebra
- Longevity studies
- Mathematical modelling
- Multivariate analysis
- Neural networks
- Numerical optimisation
- Optimal control computation
- Simulation
- Statistical modelling
- Statistical quality control
- Time series modelling

ACADEMIC STAFF'S RESEARCH INTEREST

For our academic staff's research interests, you may refer to
https://sunwayuniversity.edu.my/school-of-mathematical-sciences/staff-profiles
or scan

CONTACT

For more information, please email
mma_sms@sunway.edu.my

DOCTOR OF PHILOSOPHY IN MATHEMATICAL SCIENCES

DURATION

Full-time - 3 years
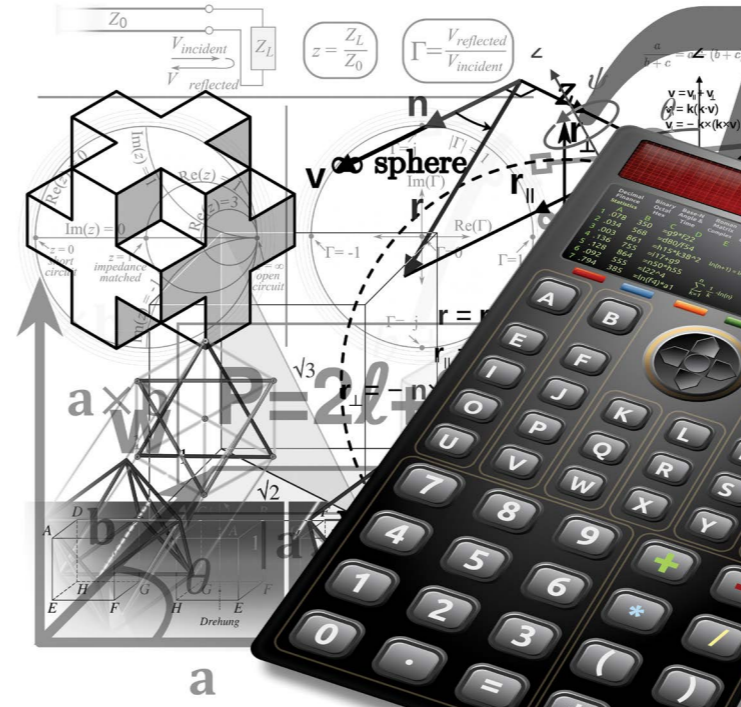Part-time - 4 years

INTAKES

January and July

RESEARCH PROGRAMME

This research programme embarks in high quality and innovative research in the broad field of mathematical sciences that demonstrates the beauty of numbers and algorithms, and their usefulness in decision-making and problem-solving.

This research programme aims to develop your research skills in one of the many exciting areas of mathematics, ranging from pure mathematics, applied mathematics to statistics. Working closely with your supervisors, you will be exposed to the different aspects of research activities, including developing a comprehensive literature review, identifying areas of contribution, and communicating research outputs via journal publications and conference presentations.

The Doctor of Philosophy in Mathematical Sciences will equip you with strong mathematical, analytical and statistical data analysis skills, to become experts and well-qualified researchers.

CAREER PROSPECTS

Doctoral graduates may enter careers in academia, consulting or research, as well as undertake specialist roles in areas related to mathematics and statistics in various organisations, such as universities, research institutes, and industrial R&D laboratories.

PROGRAMME STRUCTURE

Candidates are required to complete **three core modules**, in addition to the thesis component

- **Research Methodology**
  In this module, you will have an opportunity to examine research designs with methodology as well as data analysis techniques employed by researchers. Students are required to attend 2 hours of class per week on a weekday, for a duration of 14 weeks.

- **Academic Writing**
  In this module, you will learn to review the main research topics within a chosen field of study and appraise current key research activities related to the chosen research topic.

- **Research Proposal**
  In this module, you will learn to adhere to the research milestones planned in the research proposal and verify arguments/solutions to answer the research questions with suitable applications. You are expected to be able to formulate a research proposal that adheres to ethics and professionalism.

Thesis
The Doctor of Philosophy in Mathematical Sciences is awarded based on the successful completion of a thesis. The Thesis should demonstrate proficiency, criticality and mastery in the subject or chosen area of research.

AREAS OF RESEARCH

The School has a dedicated team of academicians who will mentor and discuss possible research topics with you in the following areas of research interests, but not limited to:

- Applications of statistics in finance and insurance
- Applied probability
- Applied stochastic processes
- Big data analytics
- Combinatorics
- Computational fluid dynamics
- Credit risk modelling
- Evolutionary computation
- Graph theory
- Linear and multilinear algebra
- Longevity studies
- Mathematics education
- Mathematical modelling
- Multivariate analysis
- Medical statistics
- Neural networks
- Numerical optimisation
- Optimal control
- Optimal control computation
- Optimisation
- Simulation
- Statistical modelling
- Statistical quality control
- Time series modelling

ACADEMIC STAFF'S RESEARCH INTEREST

For our academic staff's research interests, you may refer to
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or scan

CONTACT

For more information, please email
pma_sms@sunway.edu.my

SUNWAY UNIVERSITY
A CLASS ABOVE

MALAYSIA'S

#1 *Again*

IN GRADUATE EMPLOYABILITY

2022 & 2023

Sunway University is honoured to be recognised as Malaysia's No. 1 in Graduate Employability* for the 2nd consecutive year and would like to thank all the local & international brands who selected graduates from Sunway University as the nation's best for 2022 and once again in 2023.

We are immensely proud of our graduates who have gone on to excel in their chosen fields and made such a huge positive impact to the performances of Malaysia's and some of the world's biggest companies.

Sunway University Graduates, Truly A CLASS ABOVE.

SUSTAINABLE DEVELOPMENT GOALS

4 QUALITY EDUCATION

sunwayuniversity.edu.my

RM **670** million
awarded in Scholarships & growing
jeffreycheah.foundation

Jeffrey Cheah Foundation
Nurturing the Seeds of Wisdom

SUNWAY UNIVERSITY DU 025 (B) A member of Sunway Education Group   No.5, Jalan Universiti, Bandar Sunway, 47500 Selangor Darul Ehsan.   *Talentbank GE Index 2023