

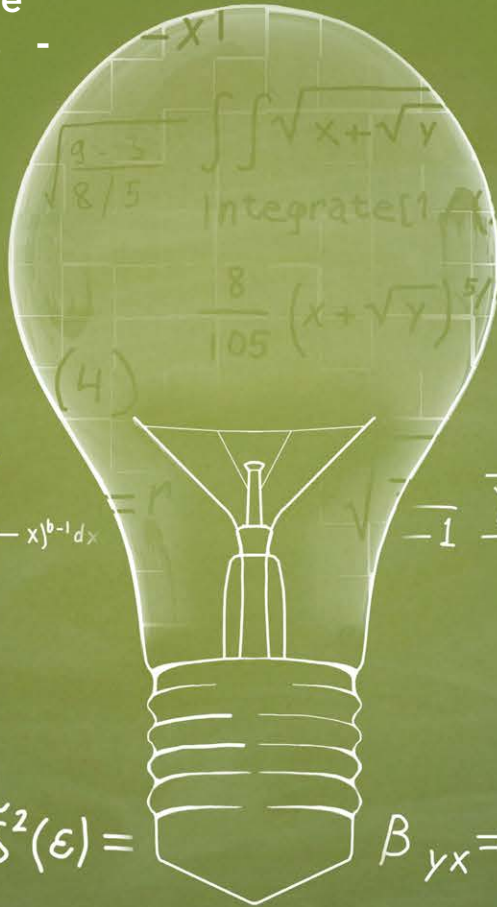
MATHEMATICAL SCIENCES

Postgraduate
- Prospectus -
2022

SUNWAY
UNIVERSITY



A CLASS ABOVE



$$)^{b-1} d \frac{x^a}{a} =$$

$$\int_0^1 x^a (1-x)^{b-1} dx =$$

$$\int_0^1 x^{a-1} (1-x)^{b-1} dx =$$

$$B(a, b) = \frac{b-1}{a} B(a, b-1)$$

$$B(a, b) = \frac{b-1}{a+b-1} B(a, b-1)$$

$$\tilde{G}^2(\epsilon) = \tilde{S}^2(\epsilon) =$$

$$\beta_{yx} = r_{yx} \cdot \frac{S_y}{S_x}$$

$$X = \begin{pmatrix} h & \sum_{i=1}^n x_{i1} & \sum_{i=1}^n x_{i2} \\ \sum_{i=1}^n x_{i1} & \sum_{i=1}^n x_{i1}^2 & \sum_{i=1}^n x_{i1} x_{i2} \\ \sum_{i=1}^n x_{i2} & \sum_{i=1}^n x_{i1} x_{i2} & \sum_{i=1}^n x_{i2}^2 \end{pmatrix}$$

$$\frac{\sum_{i=1}^N \nabla x_f \cdot \nabla y_f}{\sqrt{\sum_{i=1}^N \nabla^2 x_f \cdot \sum_{i=1}^N \nabla^2 y_f}}$$

$$\int \frac{8}{105} (x+\sqrt{y})^{5/2} dx$$

$$X = \begin{pmatrix} h & \sum_{i=1}^n x_{i1} & \sum_{i=1}^n x_{i2} \\ \sum_{i=1}^n x_{i1} & \sum_{i=1}^n x_{i1}^2 & \sum_{i=1}^n x_{i1} x_{i2} \\ \sum_{i=1}^n x_{i2} & \sum_{i=1}^n x_{i1} x_{i2} & \sum_{i=1}^n x_{i2}^2 \end{pmatrix}$$

$$\frac{dQ_{ex}}{de} \cdot \frac{e}{Q_{ex}}; \epsilon_{im} = \frac{dQ_{im}}{de} \cdot \frac{e}{Q_{im}}$$

$$B(a, b) = \int_0^1 (1-x)^{b-1} dx \frac{x^a}{a}$$

$$= \frac{b-1}{a} B(a, b-1) - \frac{b-1}{a}$$

$$B(a, b) = \frac{b-1}{a+b-1}$$

$$\int \int \sqrt{x+\sqrt{y}} dx$$

$$\frac{1}{56} (7 + \sqrt{7(-5 + \dots)})$$

$$\sum_{t=2}^n (y_t - y_{t-1}) \cdot (y_{t-1})$$

$$\frac{e}{Q_{im}}$$

$$\Delta e - e Q_{im}$$

$$)^{b-1} dx - \frac{b-1}{a} \int_0^1$$

$$1) - \frac{b-1}{a} B(a, b)$$

$$B(a, b-1) = r$$

CONTENTS

- 04 • Welcome
- 05 • Why choose Sunway University Postgraduate Studies
- 06 • Introduction
- 08 • MSc in Actuarial Science
- 10 • PhD in Mathematical Sciences
- 14 • Research Supervisors' Profile
- 15 • Bursary & Scholarships



CONTACT:

SUNWAY UNIVERSITY DU025 (B)
Owned and governed by the Jeffrey Cheah Foundation
Registration no : 200701042913 (800946-T)



📍 No. 5, Jalan Universiti, Bandar Sunway, 47500 Selangor Darul Ehsan, Malaysia.

🌐 university.sunway.edu.my

✉ info@sunway.edu.my

☎ +6 [03] 7491 8622

📘 SunwayUniversity

🐦 @SunwayU

This brochure is valid for our 2022 intakes. All information is correct at the time of printing (January 2022).
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SUNWAY IS ONE OF THE TOP 150 UNIVERSITIES IN THE WORLD UNDER 50 YEARS OLD

Sunway University is a leading not-for profit private university committed to the pursuit of educational excellence through scholarship, research and enterprise.

The University is ranked among the top 750 universities in the world according to the QS World University Rankings 2021 and is ranked among the top 18% in the QS Asia University Rankings 2022. It has a 5-Star institutional rating in the QS Stars University Ratings in its latest assessment, demonstrating excellence in the individual categories of "Teaching", "Employability", "Facilities", "Inclusiveness" and "Social Responsibility".

The University also enjoys the 5-Star "Excellent" rating in the National SETARA quality assessment, a rating that has been consistently maintained since 2009.

All these accolades bear testament to Sunway's resolve in ensuring high quality teaching, research and service excellence.



United Nations chosen destination for Sustainable Development Goals in Asia





WELCOME

I am delighted to welcome you to this latest brochure of postgraduate programmes at Sunway University. In today's highly competitive job market where it is important to maximise your opportunities, studying for a postgraduate qualification can give you a significant edge.

In this brochure you will find a wide range of advanced programmes from the fields of business, the arts and the sciences. These include both taught Master's programmes and research Master's and Doctoral programmes. Each of these programmes has been carefully designed to give you the advanced skills and knowledge to be a future leader in your chosen field of activity. Some are offered in part time mode, others in full time mode, in order to suit your own particular lifestyle and needs at the current stage of your career. Whether you are a fresh graduate (or soon-to-be graduate), or are already in work and wishing to upskill yourself to prepare for a career move or promotion, I'm sure you will find something of interest.

At Sunway University we have outstanding facilities to support our postgraduate programmes, including state-of-the-art laboratories and a dedicated graduate centre. We have expert lecturers and research professors in many areas who teach our postgraduate programmes and supervise postgraduate research theses. We pride ourselves on being a high quality university (rated 5-stars "excellent" by the Ministry of Higher Education in the "SETARA 2017" quality review exercise) and we are now ranked in the top 4.4% of universities in Asia (QS Asia ranking 2021). Some of our postgraduate degrees are offered in collaboration with Lancaster University, which is one of the UK's top ten universities, leading to dual degrees. We also offer generous scholarships for many of our postgraduate programmes — you will find all the details in the following pages. Do get in touch and discuss your own particular requirements and aspirations with our academics who will be delighted to help you.

Thank you for considering Sunway University for your postgraduate studies. I very much hope to welcome you to Sunway in the near future.

G Wilkinson

Professor Graeme Wilkinson

DPhil (Oxford) FBCS FRSA
(Vice-Chancellor)



WHY CHOOSE SUNWAY UNIVERSITY POSTGRADUATE STUDIES

According to the Times Higher Education Supplement a person with a postgraduate degree earns 50% more in life than a Bachelor's degree holder and more than double a person who leaves school to enter work. This means the investment you make in a Sunway University postgraduate degree will repay itself many times over and make you stand out in an increasingly competitive job-market.

At Sunway we offer you a range of world-class postgraduate degrees designed to equip you with the transferrable skills needed for success in your chosen career. Our 5-star QS ranking for Employability means you can be confident that you will graduate ready for the fast-track to the top. The national government has given Sunway University a 5-star grade in the last three SETARA quality assessments, placing us consistently among the top universities in Malaysia, and the QS university ranking organisation has placed Sunway in the top 4.4% of universities across Asia.

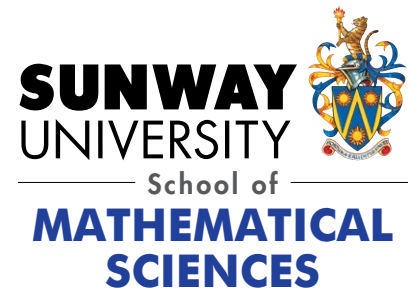
We have made substantial investments in new buildings and our facilities are independently ranked as among the best in Asia. As well as working with the best equipment you will also have full membership of our 5-star ranked library and access to the latest information and educational technology. During your course you will be guided by a personal tutor chosen from our expert faculty and you will receive some of the best teaching in the world, ranked at 5-stars for excellence. Our partnerships with Oxford, Harvard and Cambridge Universities mean that you will also have the opportunity to take part in lectures, workshops and visits with the world's leading institutions of higher education. If you have the ability, passion and motivation to take your education to the next level and kick-start your career, then this is your time and we want you to apply to Sunway.

Peter

Professor Peter Heard
(Provost)



INTRODUCTION



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 two home-grown postgraduate research programmes, namely MSc in Actuarial Science and PhD in Mathematical Sciences.

The MSc in Actuarial Science programme enables students to embark on their research journey in actuarial science and risk management, making it the ideal pathway for prospective students wishing to escalate their actuarial profession, or venture into their academic pathway.

The PhD in Mathematical Sciences programme capacitates students with the multidisciplinary and specialised mathematical sciences research skills and knowledge, which is a key to producing a dynamic and in-demand researchers for almost every industry.



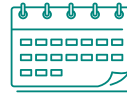


MSC IN ACTUARIAL SCIENCES



DURATION

Full-Time - 2 years
Part-Time - 3 years



INTAKES

January, April, July, September

The MSc in Actuarial Science covers a broader scope in research areas of actuarial and mathematical sciences, embedding the most urgent and current issues facing the actuarial and financial world.

The current world financial ecosystem needs to embrace the uncertainty and hazards in a changing environment, characterised by numerous unpredictable events such as climate change, natural disasters and financial crisis. Unpredictable damage brought about by the occurrence of such events can have a deep impact on the actuarial and finance industries, particularly in the area of insurance and reinsurance. Graduates of the MSc in Actuarial Science will gain competence in research skills in areas such as catastrophe modelling, disaster management, corporate failure, financial crisis, longevity and morbidity risk, pension planning and pricing of insurance or reinsurance products. You will also be equipped with skill sets to embark on careers in financial management, insurance or reinsurance and other risk-related analysis.

The MSc in Actuarial Science 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 PROSPECT



Graduates may enter careers in actuary, academia, consulting or research, as well as undertake specialist roles in areas related to insurance, finance and business.

ENTRY REQUIREMENTS

POSTGRADUATE PROGRAMME

MSc IN ACTUARIAL SCIENCE

Bachelor's Degree

- A Bachelor's Degree in Actuarial Science, Mathematics, Statistics, Quantitative Analysis or related area with minimum CGPA of 2.75 or equivalent.

Other Qualifications

- Any other qualifications will be considered on a case-to-case basis.

ENGLISH LANGUAGE REQUIREMENTS (for International Applicants):

Applicants whose medium of instruction for their Bachelor's degree was not English will be required to provide evidence of language ability.

IELTS

- 6.0 or equivalent

TOEFL

- 550 (paper-based), 213 (computer-based) or 80 (internet-based)

PTE Academic

- 50 overall (minimum 46 in each skill)

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 MSc 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 and in-house actuaries who will mentor and discuss possible research topics with you in the following areas of research interests, but not limited to:

- Credit risk modelling
- Financial modelling
- Insurance pricing optimisation
- Loss reserving techniques
- Morality/morbidity/longevity of a population
- Risk management
- Statistics and actuarial modelling

STATEMENT OF RESEARCH INTEREST

The statement of research interest should comprise a maximum of 1,000 words and covers the following structure:

- Working Title;
- Nature of the research that interests you and why; and
- Reference to anything you have read relevant to this research area

HOW TO APPLY

Applicants will be required to submit the following documents:

- Sunway University Postgraduate Application Form
- A photocopy of NRIC (applicable for Malaysian applicant)
- Photocopy of full set Passport including hardcover (applicable for International applicant)
- One passport-size photo with white background, size 3.5cm x 4.5cm (for Student ID Card)
- Certified true copy of Bachelor Degree transcript
- Certified true copy of Bachelor Degree completion certificate
- Updated Curriculum Vitae (CV)
- Soft copy of thesis/written project and/or any appropriate supporting portfolio of materials/prior creative works, where applicable
- Statement of Research Interest
- Evidence of English Proficiency
Cambridge 'O-Level' with grade C or above / IELTS score of 6.0 or above. Most candidates who completed their undergraduate studies in Malaysia will have met the English language requirement through having successfully completed SPM English language.

All documents are to be sent to the correspondence address or email stated below. Incomplete documents will not be processed.

Postgraduate Programmes Coordinator School of Mathematical Sciences SUNWAY UNIVERSITY

No. 5, Jalan Universiti, Sunway City
47500 Selangor Darul Ehsan,
Malaysia

Email: mas_sms@sunway.edu.my

CONTACT

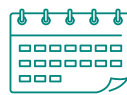
For more information, please email
Dr Cheong Huey Tyng (Programme Leader) at
mas_sms@sunway.edu.my

PHD IN MATHEMATICAL SCIENCES



DURATION

Full-Time - 3 years
Part-Time - 4 years



INTAKES

January, April, July, September

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



CAREER PROSPECT



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.

ENTRY REQUIREMENTS

POSTGRADUATE PROGRAMME

PHD IN MATHEMATICAL SCIENCES

Master's Degree

- A Master's Degree in Actuarial Science, Mathematics, Statistics, Quantitative Analysis or related area with minimum CGPA of 2.75 or equivalent.
OR

Bachelor's Degree

- Direct entry from Bachelor level, subject to meeting the following requirements:
 - CGPA \geq 3.67/First Class Bachelor Degree in related fields of study;
 - Pass Sunway University Internal Assessment; and
 - Meet other requirements set by Sunway University.

Other Qualifications

- Any other qualifications will be considered on a case-to-case basis.

ENGLISH LANGUAGE REQUIREMENTS (for International Applicants):

Applicants whose medium of instruction for their Bachelor's degree was not English will be required to provide evidence of language ability.

IELTS

- 6.0 or equivalent

TOEFL

- 550 (paper-based), 213 (computer-based) or 80 (internet-based)

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 PhD 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
- Mathematical modelling
- Multivariate analysis
- Medical statistics
- Neural networks
- Numerical optimisation
- Optimal control computation
- Simulation
- Statistical modelling
- Statistical quality control
- Time series modelling

STATEMENT OF RESEARCH INTEREST

The statement of research interest should comprise a maximum of 1,000 words and covers the following structure:

- a. Working Title;
- b. Nature of the research that interests you and why; and
- c. Reference to anything you have read relevant to this research area





HOW TO APPLY

Applicants will be required to submit the following documents:

- Sunway University Postgraduate Application Form
- A photocopy of NRIC (applicable for Malaysian applicant)
- Photocopy of full set Passport including hardcover (applicable for International applicant)
- One passport-size photo with white background, size 3.5cm x 4.5cm (for Student ID Card)
- Certified true copy of Bachelor Degree transcript
- Certified true copy of Bachelor Degree completion certificate
- Certified true copy of Masters Degree transcript
- Certified true copy of Masters Degree completion certificate
- Updated Curriculum Vitae (CV)
- Soft copy of thesis/written project and/or any appropriate supporting portfolio of materials/prior creative works, where applicable
- Statement of Research Interest
- Evidence of English Proficiency
Cambridge 'O-Level' with grade C or above / IELTS score of 6.0 or above. Most candidates who completed their undergraduate studies in Malaysia will have met the English language requirement through having successfully completed SPM English language
- Any other documents supporting the application

All documents are to be sent to the correspondence address or email stated below. Incomplete documents will not be processed.

Postgraduate Programmes Coordinator
School of Mathematical Sciences
SUNWAY UNIVERSITY
 No. 5, Jalan Universiti, Sunway City
 47500 Selangor Darul Ehsan,
 Malaysia
 Email: pma_sms@sunway.edu.my

CONTACT

For more information, please email
Dr Sim Kai An (Programme Leader) at
pma_sms@sunway.edu.my

RESEARCH SUPERVISORS' PROFILE

DR ANG SIEW LING

Lecturer

- Actuarial mathematics
- Loss reserving in non-life insurance
- Predictive modelling
- Data modelling
- Statistical analysis

DR CHEONG HUEY TYNG

Senior Lecturer

- Mathematical modelling
- Numerical methods
- Computational fluid dynamics

DR GAN CHEW PENG

Lecturer

- Credit risk modelling
- Data science and analytics
- Multivariate analysis

DR HO CHEE KIT

Professor & Dean –
School of Mathematical Sciences

- Combinatorics
- Graph theory

DR JANE TEH KIMM LII

Senior Lecturer and Associate Dean (Education) –
School of Mathematical Sciences

- Longevity studies
- Medical statistics

DR KHOO WOUI CHEN

Senior Lecturer and Acting Head –
Department of Applied Statistics

- Time series of counts
- Statistical models and inference
- Data analytics

DR LAI KEE HOUNG

Senior Lecturer and Associate Dean
(Engagement and Internationalisation) –
School of Mathematical Sciences

- Neural networks
- Evolutionary computation
- Swarm intelligence

DR LEE MOK SIANG

Lecturer and Head –
Centre for Actuarial and Analytics Research

- Numerical optimisation
- Computational mathematics
- Big data analytics

DR LEOW SOO KAR

Associate Professor

- Numerical optimisation
- Computational mathematics
- Big data analytics

DR LIEW KHANG JIE

Lecturer

- Geometric modelling
- Cryptography

DR SIM KAI AN

Lecturer

- Graph theory
- Combinatorics

DR TEO KOK LAY

Professor and Associate Dean (Research) –
School of Mathematical Sciences

- Optimal control computation with applications
- Numerical optimisation with applications

DR YEONG WAI CHUNG

Associate Professor

- Statistical quality control

BURSARY & SCHOLARSHIP



POSTGRADUATE PROGRAMMES BY RESEARCH

ELIGIBILITY CRITERIA

Scholarships are open to all **full time postgraduate** students enrolled for programmes **by research**. Eligibility criteria are given in the table below. Additionally, applicants must meet all necessary entry requirements for their chosen programme of study and be in receipt of an unconditional offer from the University.

Awards made to students under this scheme shall take effect from the 1st day of enrolment and shall, subject to satisfactory performance and successful progression, last for the normal duration of the programme. The University reserves the right to withdraw the award at any time should the student's behaviour or performance be unsatisfactory, or the student withdraws or is withdrawn from the postgraduate study.

The student must have successfully completed their proposal defense, have received ethics approval and be able to demonstrate that data collection has commenced by the end of Year 1 to continue the scholarship funding for Year 2.

ELIGIBILITY CRITERIA FOR BURSARY OR SCHOLARSHIP

Programme	FUNDED PROJECT SUPPORT SCHEME		BURSARY*		SCHOLARSHIP**	
	Mode of Study	Quantum	Mode of Study	Quantum	Mode of Study	Quantum
Masters by Research	Full-Time	100% tuition fee waiver	Full-Time	30% tuition fee waiver	Full-Time	60% tuition fee waiver
PhD by Research	Full-Time	100% tuition fee waiver	Full-Time	50% tuition fee waiver	Full-Time	100% tuition fee waiver

* Bursary is only offered to Sunway graduates from Sunway Education Group higher education institutions.

** Scholarship is open to Sunway and non-Sunway graduates.

IN PARTNERSHIP WITH THE WORLD

UNIVERSITY OF CALIFORNIA, BERKELEY

HARVARD UNIVERSITY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY



LANCASTER UNIVERSITY

UNIVERSITY OF OXFORD

UNIVERSITY OF CAMBRIDGE



LE CORDON BLEU

ALIBABA BUSINESS SCHOOL



As part of our nation building ambitions, Sunway University has travelled the world seeking out the finest educational opportunities, bringing them closer to you.

LIVE

Whilst most universities have a campus, only Sunway University has a city. Experience a world-class education right here at Sunway City, Malaysia's model smart-sustainable city enabled by 5G.

LEARN

International collaborations with the world's most renowned institutions offer Malaysians world-class education at local prices, avoiding the expensive cost of overseas travel and unfavourable exchange rates.

LEAD

Currently pioneering research with the University of Cambridge to collaborate on ways to combat the Covid-19 pandemic in the Jeffrey Cheah Biomedical Centre at the University of Cambridge.

LEGACY

Located at Sunway City, Malaysia, Sunway University joins New York & Paris as one of the three United Nations Sustainable Development Solutions Network (SDSN) Centres in the world to coordinate continent-wide sustainable initiatives.

ONE UNIVERSITY, A WORLD OF OPPORTUNITIES.

A CLASS ABOVE

