THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

UGC–Funded Undergraduate Programmes

Department of
APPLIED MATHEMATICS

UGC–Funded Undergraduate Programmes

CONTENT

Last updated in February 2025

DEPARTMENT OF APPLIED MATHEMATICS

As one of the three constituent departments under the Faculty of Computer and Mathematical Sciences (FCMS), the Department of Applied Mathematics (AMA) is committed to excellent teaching and research in Applied Mathematics. With leading expertise in computational mathematics, scientific engineering, differential equations, financial mathematics, applied statistics, optimization, and management science, we are committed to passing on our knowledge to future generations and benefiting society and humanity.

With this mission in mind, we offer a broad range of high quality academic programmes, which are designed to groom graduates with sound mathematical, analytical and communication skills for different employment niches. The undergraduate and postgraduate programmes administrated by the Department include:

Bachelor of Science (Honours) Scheme in Applied Mathematics and Finance Analytics (63430/ JS3220)

Major options
• Bachelor of Science (Honours) in Applied Mathematics
• Bachelor of Science (Honours) in Investment Science and Finance Analytics
• Bachelor of Science (Honours) in Quantitative Finance and FinTech

Minor in Applied Mathematics (63421-YAM)

Master of Science in Applied Mathematics for Science and Technology - Actuarial and Investment Science (63022)

Master of Science in Data Science and Analytics (62027)

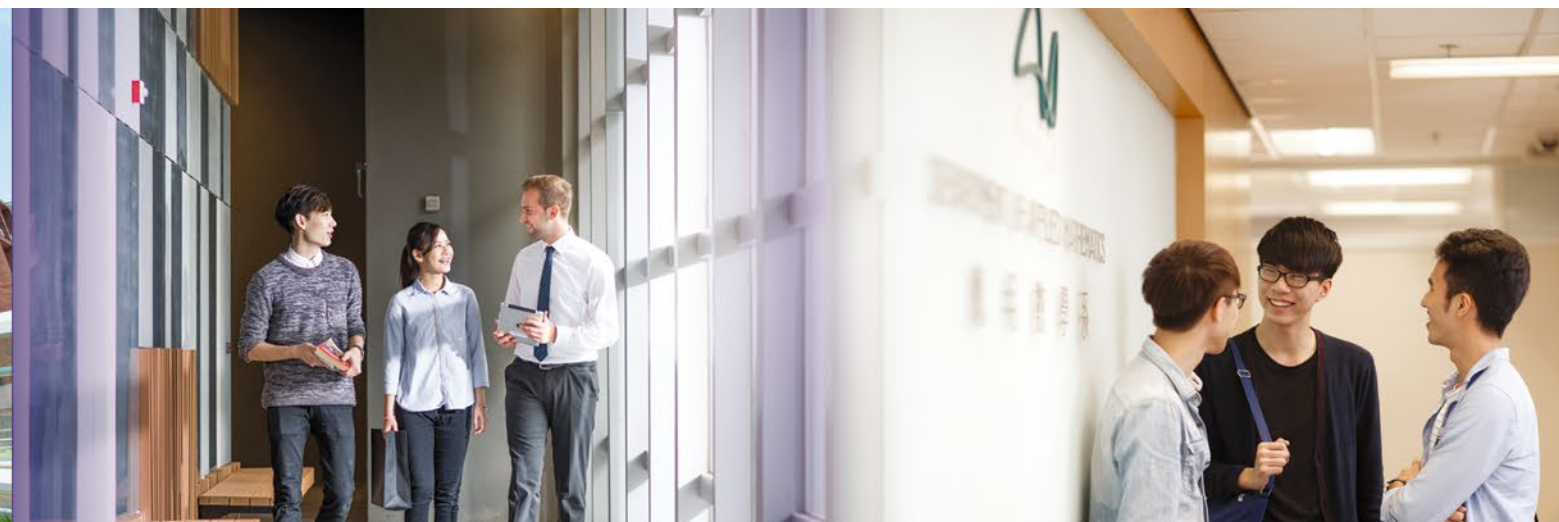### Master of Science in Operational Research and Risk Analysis (63024)

Master of Science in Quantitative Finance and FinTech (63029)

MPhil / PhD in Applied Mathematics

Bachelor of Science (Honours) Scheme in Applied Mathematics and Finance Analytics

This 4-year full-time Scheme (the Scheme) is designed to nurture future finance analytics, FinTech professionals, and applied mathematicians with solid training in mathematical and statistical skills coupled with computer programming techniques, with a special emphasis on interdisciplinary applications in investment and finance. This Scheme integrates key finance analytics, quantitative finance and FinTech elements as well as essential mathematical and statistical training, preparing students for pursuing careers in the evolving digital finance landscape or furthering their studies in related fields.

The Scheme is composed of three credit-based 4-year full-time undergraduate programmes. Students may choose between three majors upon completion of the first year of study:

Bachelor of Science (Honours) in Applied Mathematics (APP MATHS)

This programme aims to equip students with solid knowledge in mathematics, statistical analysis, computational methods, mathematical modelling, optimization, operations research, and differential equations. It is suitable for students who intend to further their studies or pursue their careers in education, research and other sectors.

Bachelor of Science (Honours) in Investment Science and Finance Analytics (ISFA)

Focusing on the strategic use of data and mathematical modelling in performing financial analysis and investment decision-making, this programme aims to cultivate investment and finance professionals with strong quantitative analysis, critical thinking, and communication skills. It prepares them for careers in various finance sectors, including investment banking, fund management, risk management and financial product development and pricing.

Bachelor of Science (Honours) in Quantitative Finance and FinTech (QF&FinTech)

This programme focuses on the strategic use of IT technology to integrate FinTech elements such as blockchain technology, information security, algorithmic trading, robo-advising, deep hedging, and various applications of machine learning and reinforcement learning in finance.

Bachelor of Science (Honours) Scheme in
APPLIED MATHEMATICS AND FINANCE ANALYTICS

General Programme Information

BSc (Hons) Scheme (APP MATHS/ ISFA/ QF&FinTech)	
Programme code	63430
JUPAS code	JS3220*
Mode of study	Full-time
Normal duration	4 years
Intake quota for local students	~19
Credits required for graduation	At least 124 credits (plus 2 training credits)

Senior Year Admission

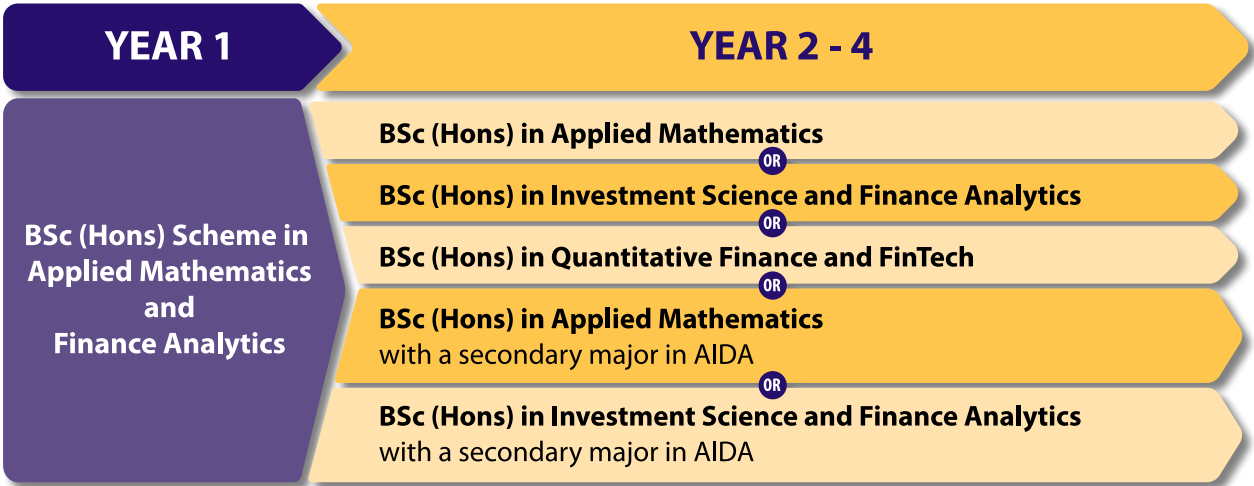| BSc (Hons) in Investment Science and Finance Analytics	
Programme code	63428-SYF
Mode of study	Full-time
Normal duration	2 years
Intake quota for local students	13
Credits required for graduation	Normally 70 credits (depending on students' entry qualification) (plus 2 training credits)

Secondary Major - Artificial Intelligence and Data Analytics

In addition to the three majors options (i.e. APP MATHS, ISFA and QF&FinTech), students in the BSc(Hons) in Applied Mathematics and the BSc(Hons) in Investment Science and Finance Analytics can opt to study a Secondary Major, which features an expanded area of studies in Artificial Intelligence and Data Analytics (AIDA).
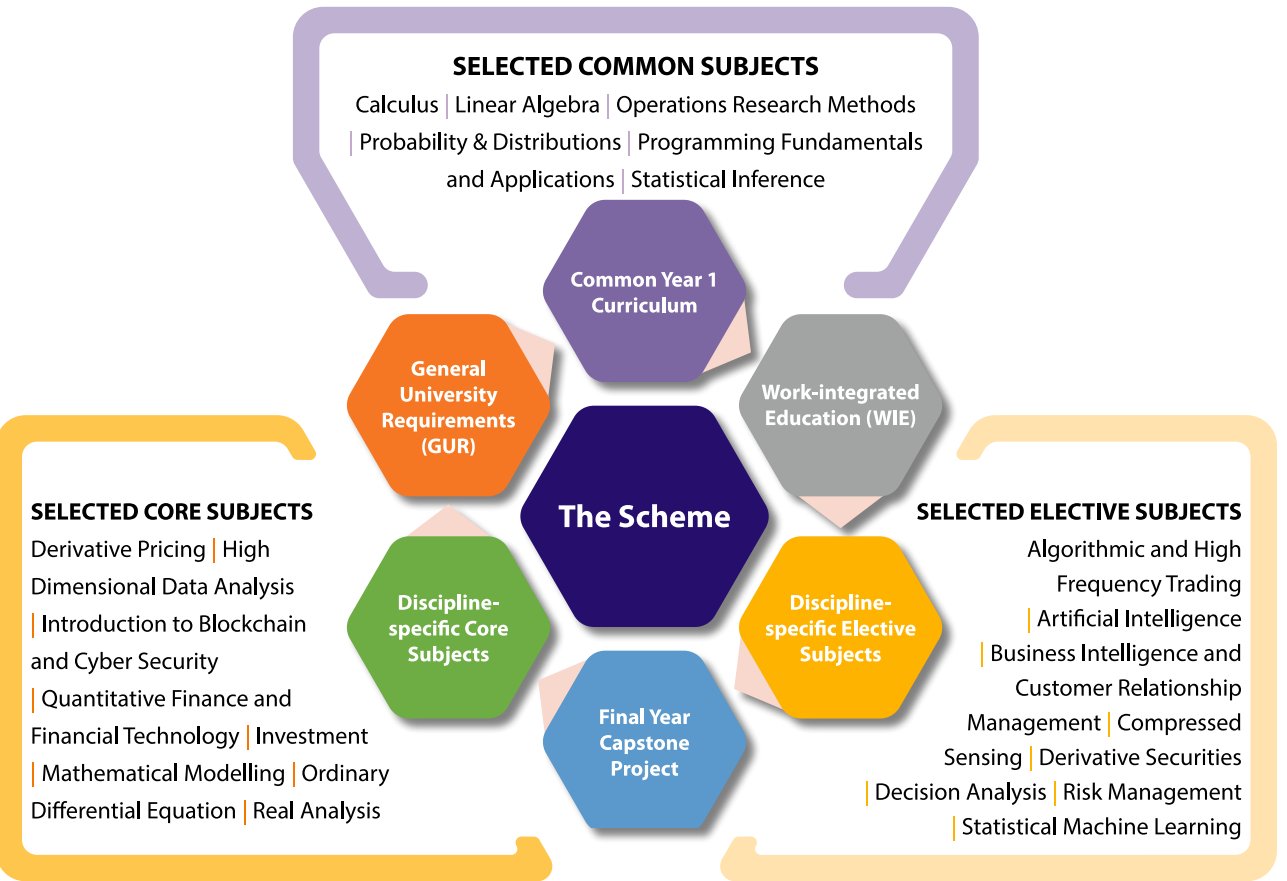
* In addition to applying directly to the BSc (Hons) Scheme above, applicants interested in our three majors can also apply for the Bachelor's Degree Scheme in Computer and Mathematical Sciences (JS3006). After completing the first year of study, students can choose one of our three majors: Applied Mathematics, Investment Science and Financial Analytics (ISFA), or Quantitative Finance and FinTech (QF&FinTech).

Study Path

YEAR 1	YEAR 2 - 4
BSc (Hons) Scheme in Applied Mathematics and Finance Analytics	BSc (Hons) in Applied Mathematics
	OR BSc (Hons) in Investment Science and Finance Analytics
	OR BSc (Hons) in Quantitative Finance and FinTech
	OR BSc (Hons) in Applied Mathematics with a secondary major in AIDA
	OR BSc (Hons) in Investment Science and Finance Analytics with a secondary major in AIDA

Programme Structure

SELECTED COMMON SUBJECTS
Calculus | Linear Algebra | Operations Research Methods | Probability & Distributions | Programming Fundamentals and Applications | Statistical Inference

- Common Year 1 Curriculum
- General University Requirements (GUR)
- Work-integrated Education (WIE)
- The Scheme
- Discipline-specific Core Subjects
- Discipline-specific Elective Subjects
- Final Year Capstone Project

SELECTED CORE SUBJECTS
Derivative Pricing | High Dimensional Data Analysis | Introduction to Blockchain and Cyber Security | Quantitative Finance and Financial Technology | Investment | Mathematical Modelling | Ordinary Differential Equation | Real Analysis

SELECTED ELECTIVE SUBJECTS
Algorithmic and High Frequency Trading | Artificial Intelligence | Business Intelligence and Customer Relationship Management | Compressed Sensing | Derivative Securities | Decision Analysis | Risk Management | Statistical Machine Learning
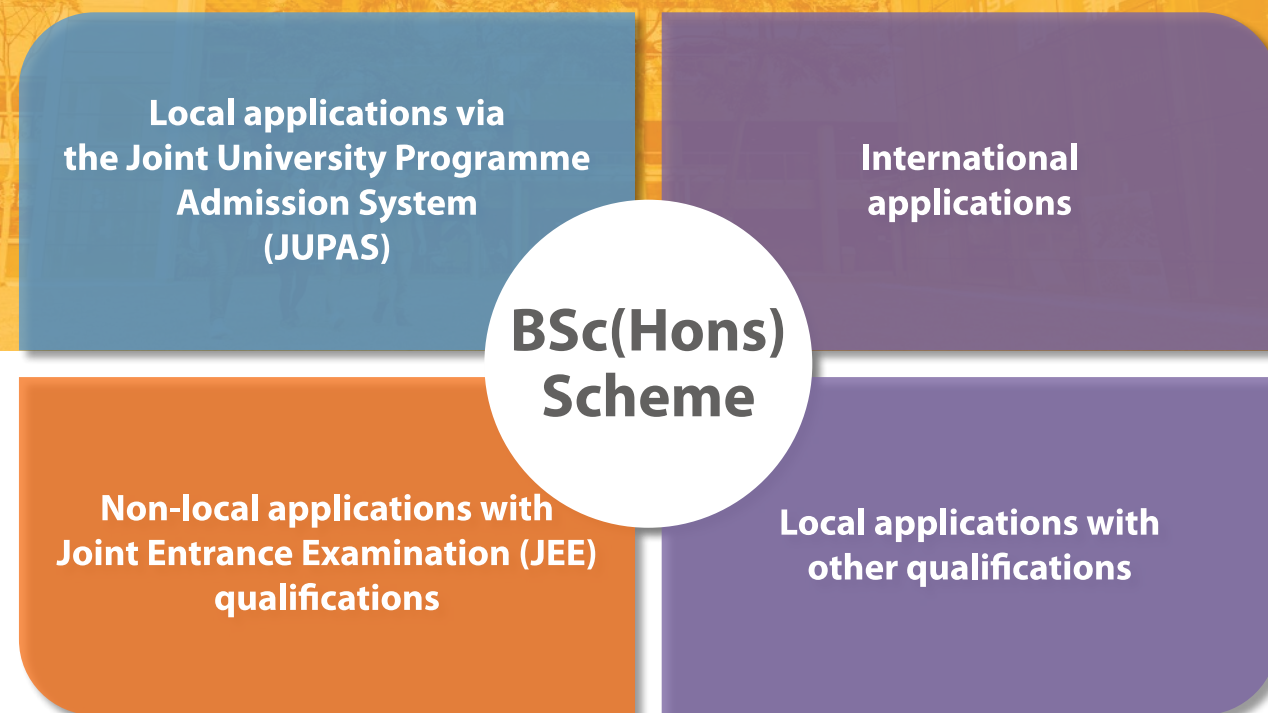
Remarks:
- Students must apply to and obtain approval from the programme offering Department, no later than the commencement of the second year of study, to be admitted to the Secondary Major.
- Only students with a Cumulative GPA of 2.70 or above may be considered for Secondary Major enrolment. Each Secondary Major may stipulate additional selection criteria for admission.
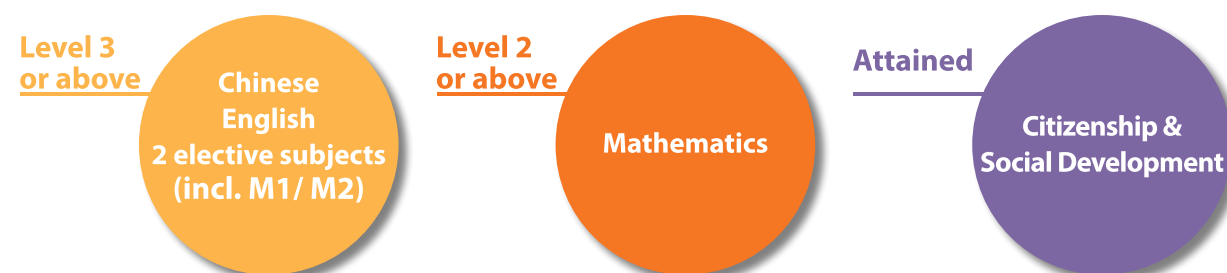
ENTRANCE REQUIREMENTS

BSc(Hons) Scheme

- Local applications via the Joint University Programme Admission System (JUPAS)
- International applications
- Non-local applications with Joint Entrance Examination (JEE) qualifications
- Local applications with other qualifications

Admission to 4-year Programme

For JUPAS applicants with Hong Kong Diploma of Secondary Education (HKDSE) qualifications, they must satisfy the General Entrance Requirements of PolyU:

Level 3 or above
Chinese
English
2 elective subjects (incl. M1/ M2)

Level 2 or above
Mathematics

Attained
Citizenship & Social Development

For non-JUPAS and non-local applicants, the University will consider other qualifications as being equivalent to the specified entrance requirements on their individual merits. Please visit our website for details.

Admission to 2-year Programme (Local Senior Year Admission)

Eligible applicants should hold an appropriate Associate Degree or a Higher Diploma in Statistics, Information Technology, Engineering, Science or Business or similar qualification from a recognised institution. Suitable candidates will be considered for advanced standing entry to the senior year curriculum.

Interview

The interview aims to test the potential for and interest of applicants in the programme, and their communication skills and general knowledge in the field of study.

For HKDSE applicants:
Selected applicants will be invited to attend an interview prior to the announcement of HKDSE result.

For other applicants:
Selected applicants will be invited to attend an interview.

Scholarship

To recognize outstanding students admitted to our full-time undergraduate programmes, the Department offers entrance scholarship for local students with outstanding performance in HKDSE and/ or in their previous AD/ HD studies.

Professional Recognition

Upon the completion of programme, graduates with the major in BSc (Hons) in Investment Science and Finance Analytics are expected to receive partial exemption from the professional assessment of:

- Hong Kong Securities and Investment Institute
- Hong Kong Statistical Society
- Royal Statistical Society of UK

The ISFA programme is affiliated with the CFA Institute University Affiliation Program. This affiliation demonstrates that the ISFA curriculum is closely tied to professional practice and well-suited to preparing students to sit for the CFA examinations. The curriculum has been acknowledged as covering at least 70% of the CFA Program Level I Candidate Body of Knowledge (CBOK) topics. Through participation in the affiliation program, CFA student scholarship is available to ISFA students. Please visit our website for details.

University Affiliation Program
CFA Institute®

EXCELLENT CAREER PROSPECTS

Our programmes are designed to meet the growing market demand of professionals who possess a unique blend of finance knowledge and advanced analytical skills. Our focus on mathematics, statistics, and computer programming skills represents a holistic approach to training future finance analytics professionals.

In the past decade, the Department of Applied Mathematics has groomed thousands of graduates and most of them have found employment in prestigious and renowned corporations throughout the Asia Pacific area. They have applied their professional knowledge and developed excellent career path in various industries:
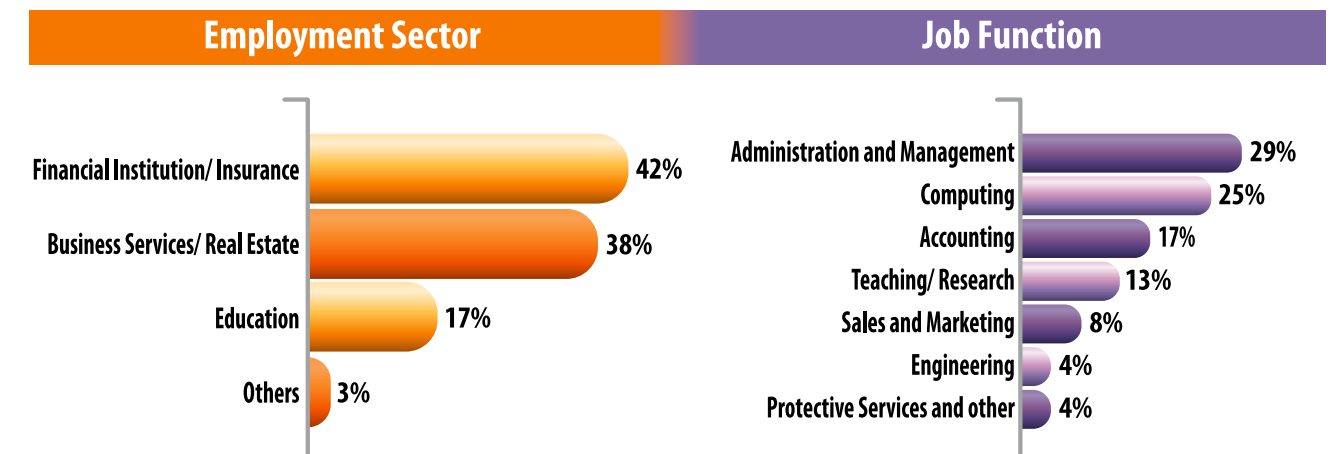
✓ **Commercial and Investment Banks**
✓ **Insurance Companies**
✓ **Securities Institutions**
✓ **Accounting/Auditing Firms**
✓ **Asset Management Companies**
✓ **Marketing Research Companies**
✓ **Regulatory Authorities**
✓ **Information Technology Solution Providers**
✓ **Trading Platform Providers**
✓ **Database Management Service Companies**

Some of the organizations where our graduates land their dream career:

Investment Science and Finance Analytics

Employment Sector	Job Function

Employment Sector
- Financial Institution/Insurance — 42%
- Business Services/Real Estate — 38%
- Education — 17%
- Others — 3%

Job Function
- Administration and Management — 29%
- Computing — 25%
- Accounting — 17%
- Teaching/Research — 13%
- Sales and Marketing — 8%
- Engineering — 4%
- Protective Services and other — 4%

Basis on the result of Graduate Employment Survey released in July 2024

Further Study

Our programmes not only support graduates to land dream jobs in notable companies, but also pave the way for advance education. Upon graduation, a number of our students pursue further study in world-class universities:

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ALUMNI SHARING

Graduates of BSc (Hons) in Investment Science/ Investment Science and Finance Analytics

Elvis Wong
Standard Chartered Private Wealth Management

The Investment Science programme helped me develop analytics and problem solving skill which has laid a strong foundation for my career development.

Jenna Ho
CitiBank

This programme integrated both mathematical and financial knowledge. I'm well prepared to establish insight through analyzing data and pursue career in the banking industry.

Edward Yeung
Sky Wealth

Having the chance to practice and gain hands-on experience on the renowned Bloomberg Terminal gave me an edge in landing my career in financial industry.

Zhuang Yufan
Postgraduate student University of California San Diego

AMA's professors are very enthusiastic. PolyU has a solid and extensive alumni network which greatly facilitates students' career planning. Thanks to PolyU and AMA, I have had a lot of opportunities to explore and develop my interest liberally during my undergraduate study period.

Heidi Wan
Secondary School Teacher

Studying in AMA is an unforgettable experience to me. Exchange and internship opportunities were always open for us to strengthen our learning experience and help us find our true selves. Many of us have found our career paths by taking internship.

Kwok Ngok Sang
Postgraduate student PolyU

The ISFA programme offers a diverse range of courses in Finance and Computer Science, as well as internship and research opportunities which have helped me establish a solid foundation of knowledge and skills in these areas. The lecturers are not only experts in their respective fields but also passionate about teaching. This creates a collaborative and supportive learning environment.

Eurus Lam
The Bank of East Asia

The Investment Science and Finance Analytics programme provided a solid foundation in finance and mathematics, enabling me to analyze financial trends and make informed decisions. It has also fostered my understanding of the importance of digital transformation in the financial industry, allowing me to navigate the evolving landscape with confidence.

Kelvin Ng
HKEX

Graduated from Investment Science and Finance Analytics, I gained skills in Mathematics, Finance, and Computing, thriving as a Graduate Associate at HKEX. AMA's comprehensive resources enhanced my professionalism through lectures, entrepreneurship, community service, internships, and research projects.

Jocelin Chan
Census and Statistics Department, HKSAR

From the basic theories of Mathematics, Statistics and Finance, to their real world applications in Finance industry, I'm equipped with analytical, organizational and communication skills to develop a prospective and wonderful future.

Zhang Xingyue
Postgraduate student EPFL, Switzerland

The IS programme is a perfect blend of statistics, programming, finance and definitely helpful for my future study and career. The courses prepared me for pursuing further study in Data Science. Our department would also offer us research opportunities and keep us posted for any update on the career market.

So Tze Yau
AXA China Region Insurance Company

AMA programme offers a comprehensive curriculum that encompasses statistics, finance, and computer programming, equipping me with practical skills applicable to data analysis. My university life has been both memorable and challenging. Through academic studies, exchange experiences, and work opportunities, I have experienced personal growth and enhanced problem-solving skills.

Nancy Dong
Postgraduate student University of Oxford

Beyond the classroom teaching, we have ample learning opportunities, e.g. internship, exchange and academic research, providing us an exceptional platform to achieve both academic and personal growth, while also fostering an international perspective.

INTERNSHIP
(WORK-INTEGRATED EDUCATION)

PolyU emphasizes practical training and connecting classroom theory with workplace application. All undergraduate programs include a mandatory Work-integrated Education (WIE) component. Students of AMA require to complete at least 120 hours of internships related to their studies. These internships provide hands-on experience, enhancing professional competence, independent thinking, communication skills, and a global outlook.

Hurbert Yan
Intern at KPMG

Dicky Pang
Intern at DZ Bank AG HK Branch

Kelvin Ng
Intern at HKEX

Alex Wong
Sport Statistics Scientist and Marketing Intern at NBN23, Spain

Jerry Woen
Intern at Robustus Investment Management Ltd

Edmond Lam
Intern at Census and Statistics Department, HKSAR

Kan Wai Yi
Intern at HSBC Life

True Yip
Intern at Rock Tape, Russia

Eurus Lam
Intern at JLL

Ji Xintong
Intern at China Galaxy Securities Company Ltd

Wan Ho Lam
Intern at Hang Seng Bank

SATO Taro
Intern at Aristo Market Research & Consulting Co. Ltd.

STUDENT EXCHANGE

Participating in an exchange study is both exciting and life-enriching. To foster global citizenship and promote academic and cultural exchange, we encourage students to actively engage in opportunities beyond the school campus. Our students returning from overseas exchanges gain valuable experiences and develop a fresh perspective on the world and their future.
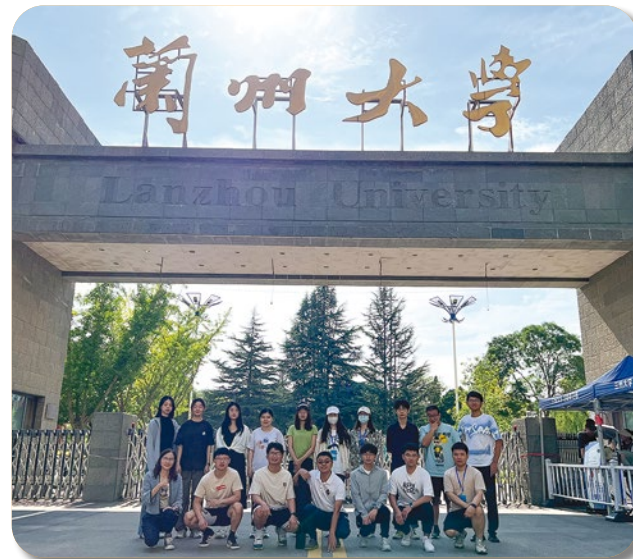
BEYOND CLASSROOM ACTIVITIES

To facilitate students' learning and enhance their all-round development, the Department organizes various activities beyond classroom.

COMPANY VISIT

STUDENT LEARNING TOURS

ALUMNI-STUDENT NETWORKING EVENTS

CAREER TALK AND TRAINING