Physics Foundation for an Intelligent Future

About AP

The Department of Applied Physics (AP) was founded in 1987, and we are devoted to become a world-class physics department. We brought in high-caliber scholars and researchers with diverse expertise to enrich our curriculum and scientific innovations, with a strong focus on the development of cutting-edge technologies such as new materials, artificial intelligence, big data and optoelectronics. Over the years, AP has nurtured talents with fundamental and applied scientific knowledge, skills, and innovative mindset. Our graduates are welcomed by employers and have made significant contributions to the industries and the community. We achieved remarkable results in various University rankings.

39th
Best Universities for Nanoscience and Nanotechnology
2025 U.S. News & World Report

72nd
Materials Science
QS World University Rankings 2025 by Subject

97th
Physical Sciences
Times Higher Education (THE) World University Rankings 2025 by subject

Research Excellences

AP is dedicated to becoming a world-class institution, excelling in both fundamental research and applied development. We encourage innovation and support technology transfer to advance scientific knowledge. Our faculty includes 4 highly cited researchers and 11 scientists ranked in the top 2% globally, reflecting our commitment to excellence. Our research spans critical areas, including green energy and carbon neutrality, machine learning, nanomaterials, photonics, plasmonics, and quantum physics. Recent achievements showcase our leadership in these fields. Prof. Chai developed an event-driven visual sensor integrated with a pulse neural network, published in Nature Electronics in 2023. Prof. Hao's team discovered the unique polarization properties of the new two-dimensional material $CuCrP_2S_6$, featured in Nature Communications.

Research and Innovation

AP is well-equipped with more than 30 world-class research laboratories for teaching and research purpose, including a joint AI laboratory with Huawei, University Research Facility in Materials Characterization and Device Fabrication, as well as Cleanroom facilities. Students with outstanding academic performance results are actively recruited to join research projects led by our academic staff, working on forefront topics like photovoltaics, biosensor for virus detection and new energy materials.

BSc (Hons) in Physics with a Secondary Major in Artificial Intelligence and Data Analytics (AIDA) or Innovation and Entrepreneurship (IE)

#JS3030 **25** Intakes **4 years** Full time **UGC funded**

## Acquire a Major with a Secondary Major degree in 4 years

Students enrolled to our Physics programme follow a common curriculum in the first year, before they choose a Secondary Major in either AIDA or IE in Year Two, according to their own preference. They will graduate with one of the following degrees upon successful completion of the corresponding graduation requirements:

- Bachelor of Science (Honours) in Physics with a Secondary Major in Artificial Intelligence and Data Analytics
- Bachelor of Science (Honours) in Physics with a Secondary Major in Innovation and Entrepreneurship
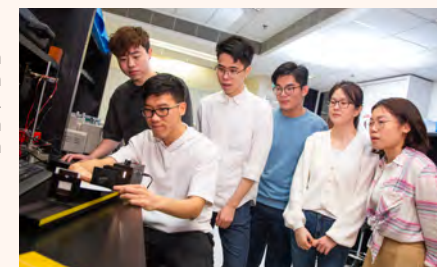
Fast-track Integrated Bachelor's and Master's Degree Programme

High-achieving students will be provided opportunities to complete a Bachelor of Science in Physics with a Secondary Major in Artificial Intelligence & Data Analytics / Innovation and Entrepreneurship, offered by the Department of Applied Physics, and a Master of Science in Medical Physics, offered by the Department of Health Technology and Informatics, in a shortened duration and with reduced tuition fee.
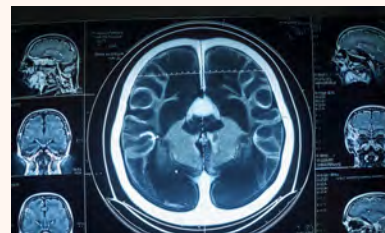
Programme Highlights

An Application-oriented approach

The learning experience is supported by well-equipped laboratories and research opportunities. Collaborations with renowned universities, research institutions and industry partners provide excellent internship and exchange opportunities for students.

Multidisciplinary Nature

The combination of physics and AIDA/IE provides students with both solid scientific knowledge and practical skillsets, opening them to a wide range of career paths such as innovation, health care and industry.

All-rounded Development

The learning pedagogies are designed to develop students' "soft skills", such as lateral thinking, communication skills, creativity, critical thinking and problem-solving skills, which are critical assets for our future leaders.

Subject List

Highlight of subjects in our 4-year curriculum. Only the core subjects of this programme are listed below. The total number of credits required for graduation is 134.

General University Requirement (GUR) (27 credits)

Cluster Areas Requirements (CAR)
Language and Communication Requirements (LCR)
Tomorrow's Leaders
Healthy Lifestyle
Introduction to Artificial Intelligence and Data Analytics
Introduction to Innovation and Entrepreneurship

Mechanics and Robotic Motion
Quantum Mechanics for Scientists and Engineers
From Semiconductor to Intelligent Devices
Scientific Instrumentation and Automation
Designing Sensing Systems for Internet of Things in Smart Cities
Energy Conversion and Storage with Machine Learning

Major – Physics (71 credits for AIDA; 74 credits for IE)

Secondary Major

AIDA (36 credits)

Programming Fundamentals and Applications
Artificial Intelligence
Data Structures and Algorithms
Machine Learning
Integrated Capstone Project
Quantitative Skills and Experimental Design for Scientists

Either one

IE (33 credits)

Management and Organisation
Business Innovation Project
Company Attachment
Creativity, Innovation and Entrepreneurship
Innovation and Entrepreneurship Colloquium
GBA Immersion / Field Study for Innovation Ecosystems

Awarded Bachelor's Degree

Bachelor of Science (Honours) in Physics with a Secondary Major in Artificial Intelligence and Data Analytics

Bachelor of Science (Honours) in Physics with a Secondary Major in Innovation and Entrepreneurship

Career Prospects

Equipped with interdisciplinary scientific knowledge, skills, and innovative mindset, our graduates are well-prepared to work in various industries or pursue further studies.

Tech-related

Data Scientist
AI Software Engineer
System Architect
System Analyst
Analyst Programmer
IT Consultant

Industry-related

Technology Consultant
Engineer
System Developer

Medical Services-related

Medical Physicist
Lab Manager
Quantitative Researcher

Research & Development-related

Researcher
Materials Engineer
R&D Engineer
Scientific/Technology Officer

Financial Services-related

Quantitative Researcher
Data Scientist
Quant Developer

Education-related

Teacher
Instructor
Teaching Assistant