FACULTY OF SCIENCE
THE UNIVERSITY OF HONG KONG
香港大學理學院

Master of Science in the field of

APPLIED GEOSCIENCES

A springboard for a robust and fruitful career

2026-27 (September 2026 intake)

IS THE PROGRAMME FOR YOU

Why this Programme

Aim: to help engineering geologists improve their performance in professional work. Engineers and scientists wanting to advance their understanding of geology and geotechnics are also invited to apply.

Two themes are accredited by the Geological Society of London
- Engineering Geology Theme*
- Engineering Geology with HKIE Approved Courses Theme*

** Applications for Chartered Geologist or Scientist (CGeol/CSci) with an accredited MSc benefit from an accelerated route, subject to satisfying all other criteria.*

The Geological Society
accredited degree programme

World-class Rankings of HKU

Quacquarelli Symonds (QS)

QS WORLD UNIVERSITY RANKINGS **#11** *World Rankings 2026*

#2 *Asia Rankings 2025*

Times Higher Education (THE)

THE World University Rankings **#33** *World Rankings 2026*

#6 *Asia Rankings 2025*

QS World University Rankings by Subject 2025

- Geology **#46**
- Environmental Sciences **#27**
- Earth & Marine Sciences **#29**

Top-notch Scientists in the Faculty

Clarivate Analytics' Essential Science Indicators:

20.8% *of our professoriate staff (average over the past decade) are classified Top 1% scholars*

What the Programme Covers

Engineering Geology Theme

Focus
- ◊ Application of geology and mechanics in geotechnical practice
- ◊ Development of professional skills

Engineering Geology with HKIE Approved Courses Theme

Coverage
- ◊ All courses are approved by the Hong Kong Institution of Engineers

General Applied Geosciences Theme

Focus
- ◊ Geology and geotechnics for scientists, including geospatial professionals

Tuition fees
- Composition fee: HK$200,000# (subject to approval)
- New grant opportunity is available for part-time students. For more details, please refer to 'Scholarships and financial support' section on Page 2.

Students are required to pay Caution Money (HK$350, refundable on graduation subject to no claims being made) and Graduation Fee (HK$350). All full-time students will be charged a student activity fee of HK$100 per annum to provide support for activities of student societies and campus-wide student events.

Programme duration Full-time: 1 year Part-time: 2 years

Study load
Credits: 66 / 69 credits
Learning hours: 1,440 or 1,500 hours
(including 360 hours for the project and contact hours of 400 / 415 hours)
Remarks: The 2-year programme imposes a heavy workload on a part-time student in a full-time job

Class schedule
- Teaching: mainly on weekday evenings
- Field and laboratory work: weekends
- Students are expected to study until 31 August and teaching is also conducted during Reading Weeks and Summer Semester

Medium of instruction
English

Assessment
Mostly coursework and written examination

#The fee shall generally be payable in 2 instalments over 1 year for full-time and 4 instalments over 2 years for part-time. Separate arrangements will apply to the awardees of the Professional Development Grant in Applied Geosciences.

Where will this Programme Lead You

Professional recognition
- ◊ The two Engineering Geology themes are accredited by the Geological Society of London which awards the qualification Chartered Geologist
- ◊ Candidates with an accredited MSc can apply for Chartered Geologist with fewer years of working experience
- ◊ The courses of the Engineering Geology with HKIE Approved Courses Theme are approved by the HKIE

Network and transferable skills
- ◊ The chance to learn from top professors and leading practitioners from industry
- ◊ Technical knowledge and professional skills you can apply anywhere
- ◊ A valuable network of industry connections; career advice and inspiration

Scholarships and financial support
- ◊ Professional Development Grant in Applied Geosciences
  - ◊ The value of the Grant shall be equivalent to 20% of the part-time MSc in Applied Geosciences tuition fee for the degree curriculum.
  - ◊ For more details: https://www.scifac.hku.hk/prospective/tpg/MSAG
- ◊ Association of Geotechnical and Geoenvironmental Specialists (Hong Kong) Scholarship
  - ◊ This HK$10,000 scholarship is awarded annually on a merit basis
- ◊ Government's Extended Non-means Tested Loan Scheme (for local students only)
  - ◊ https://www.wfsfaa.gov.hk/sfo/en/postsecondary/enls/overview.htm
- ◊ Taufik Ali Memorial Scholarships for Postgraduate Studies
  - ◊ Persons of the Muslim faith born in Hong Kong or Penang are eligible to apply
  - ◊ The scholarship may cover tuition fees on a case-by-case basis
  - ◊ For more details: https://scholar.aas.hku.hk/?action=showonesscheme&ss_id=255

Prizes
Halcrow Prizes are awarded to the Best Student and for the Best Dissertation

Courses reimbursable by the Continuing Education Fund (CEF)
- ◊ GEOS7012 **Site investigation and engineering geological techniques**
- ◊ GEOS8101 **Engineering geology and geotechnical design**
- ◊ GEOS8102 **Rock engineering and applications**

持續進修基金 Continuing Education Fund

The mother programme (Master of Science in the field of Applied Geosciences) of these courses is recognised under the Qualification Framework (QF Level 6)

Host

Department of Earth & Planetary Sciences

Founded in 1995, we initially focused on the geology of Asia and the Asia Pacific Regions, but now our scholars carry out cutting-edge research and science of societal relevance across a range of earth and planetary sciences.

Our work on applied geosciences is carried out in the real-world laboratory of Hong Kong and the region.

Who should Take this Programme

- ◊ Engineering geologists who wish to improve their performance in professional work
- ◊ Engineers and scientists, including geospatial professionals, wanting to advance their understanding of geology and geotechnics

Hear from our graduate

Olivia LAM
Class of 2017

Scan to watch: t.ly/k0-ni

Olivia LAM (Class of 2017) is working as a Senior Business Analyst for the Group Director Development & Digital Transformation at Fugro NV in the Netherlands. Her job supports the company's mid-term strategic implementation.

WHAT YOU WILL LEARN

Engineering Geology Theme (66 credits)

Core courses

GEOS7010 Geology principles and practice (6 credits)^ ***OR***
GEOS7011 Advanced geology of Hong Kong (6 credits)*
GEOS7033 Geology of Hong Kong (6 credits)^
GEOS7012 Site investigation and engineering geological techniques (6 credits)
GEOS7015 Rock mechanics (3 credits)
GEOS7016 Soil mechanics (3 credits)
GEOS7020 Project part I (6 credits)
GEOS7021 Geological fieldwork I (3 credits)^ ***OR***
GEOS8021 Geological fieldwork II (3 credits)*
GEOS8001 Hydrogeology (3 credits)
GEOS8002 Professional practice in applied geosciences (3 credits)
GEOS8003 Seminars on unforeseen ground conditions, geotechnical and environmental failures (3 credits)
GEOS8020 Project part II (12 credits)
GEOS8101 Engineering geology and geotechnical design (6 credits)
GEOS8102 Rock engineering and applications (6 credits)
GEOS8104 Natural hillside landslide and hazard studies (3 credits)*
GEOS8204 Basic structural mechanics and behaviour (3 credits)*

Elective courses

GEOS7022 Course of directed studies (3 credits)#
GEOS7035 Intermediate geology (6 credits)#
GEOS7036 Innovative technology and environmental sustainability (3 credits)#

Core courses for students with a first degree in Geology or a related subject: *GEOS7011, 7012, 7015, 7016, 7020, 8001, 8002, 8003, 8020, 8021, 8101, 8102, 8104, 8204 – 66 credits. GEOS7022 may be substituted for GEOS8204 if directed by the Programme Director.*
Core courses for students whose first degree is not in Geology or a related subject: *GEOS7010, 7012, 7015, 7016, 7020, 7021, 7033, 8001, 8002, 8003, 8020, 8101, 8102 – 66 credits.*

Engineering Geology with HKIE Approved Courses Theme (69 credits)

Core courses

GEOS7012 Site investigation and engineering geological techniques (6 credits)
GEOS7015 Rock mechanics (3 credits)
GEOS7016 Soil mechanics (3 credits)
GEOS7020 Project part I (6 credits)
GEOS7024 Management (3 credits)
GEOS8001 Hydrogeology (3 credits)
GEOS8002 Professional practice in applied geosciences (3 credits)
GEOS8003 Seminars on unforeseen ground conditions, geotechnical and environmental failures (3 credits)
GEOS8020 Project part II (12 credits)
GEOS8101 Engineering geology and geotechnical design (6 credits)
GEOS8102 Rock engineering and applications (6 credits)
GEOS8204 Basic structural mechanics and behaviour (3 credits)
GEOS8205 Mathematics I (6 credits)
GEOS8206 Mathematics II (6 credits)

Elective course

GEOS7036 Innovative technology and environmental sustainability (3 credits)#

General Applied Geosciences Theme (66 credits)

For full-time students (non-geologists)

Core courses

GEOS7010 Geology principles and practice (6 credits)
GEOS7015 Rock mechanics (3 credits)
GEOS7016 Soil mechanics (3 credits)
GEOS7020 Project part I (6 credits)
GEOS7021 Geological fieldwork I (3 credits)
GEOS7024 Management (3 credits)
GEOS7033 Geology of Hong Kong (6 credits)
GEOS7035 Intermediate geology (6 credits)
GEOS7036 Innovative technology and environmental sustainability (3 credits)
GEOS8001 Hydrogeology (3 credits)
GEOS8002 Professional practice in applied geosciences (3 credits)
GEOS8003 Seminars on unforeseen ground conditions, geotechnical and environmental failures (3 credits)
GEOS8020 Project part II (12 credits)
GEOS8209 Climate change and society (6 credits)

Remarks:
1. Certain courses may be accepted as electives at the discretion of the Programme Director
2. The programme structure will be reviewed from time to time and is subject to change
3. To be eligible for the award of the MSc in the field of Applied Geosciences, a student shall complete all core courses and total credits prescribed in a selected theme

^For students whose first degree is not in Geology or a related subject

*For students with a first degree in Geology or a related subject

#As directed by the Programme Director

Programme Structure

WHAT YOU WILL LEARN

Programme Highlights

GEOS7010 Geology principles and practice

This course provides a comprehensive review of fundamental concepts in geoscience, including earth and geological processes, surface processes, minerals and rocks, geological structures, and geological map interpretation. It aims to enhance students' practical skills in identifying minerals and rocks, which will be developed through dedicated practical sessions aimed at refining their analytical and observational abilities.

GEOS7011 Advanced geology of Hong Kong

This advanced course explores the specialised aspects of the rocks and geological formations and structures in Hong Kong and their importance in geotechnical engineering, natural hazard management and resource development. Topics include volcanic systems, volcanic-plutonic connections, marble formations and complex geology, metamorphic rocks, tectonic history and geological structures, Quaternary stratigraphy and processes, and geological aspects of landslides.

GEOS7012 Site investigation and engineering geological techniques

A professional course on the concepts and skills used in geotechnical site investigation. Topics include the design of site investigations, desk study and walkover survey, aerial photographic interpretation, soil and rock description and classification, ground investigation technology, and soil and rock laboratory testing.

GEOS7015 Rock mechanics

The course introduces the basic concepts of rock mechanics used in geotechnical practice. Topics include index properties, strength and deformability of intact rock; distribution and measurement of in-situ stresses; and shear strength of discontinuities in rock masses.

GEOS7016 Soil mechanics

An examination of the basic soil mechanics theory used in geotechnical practice. The course reviews phase relationships, elasticity and plasticity, soil classification, compaction, seepage and effective stress concepts; and provides a more detailed analysis of lateral earth pressures, shear strength and consolidation.

GEOS7020 Project part I

The first phase of an independent study of a problem in applied geosciences. It involves literature review, data collection and data analysis. Students are required to write an inception report and give a presentation on their proposed study. Professional geologists are expected to undertake a field mapping task as part of their project. This course provides a capstone experience.

GEOS7021 Geological fieldwork I

Self-directed study in the field over a 6-month period leading to the production of maps, field sheets, narrative accounts and other geological records for assessment. The fieldwork may be undertaken in association with the excursions of the Department of Earth and Planetary Sciences, the local learned societies or independently.

GEOS7022 Course of directed studies

Studies to assist learning in the core courses, involving some of the following activities: professional activities, field work, laboratory work, internship, class exercises, tutorials and reading.

GEOS7024 Management

This course introduces the basic knowledge of project management practice. It will cover the following topics: engineering processes, programming and procurement strategies; contract management; construction site safety, health and environmental aspects; quality control and quality assurance.

GEOS7033 Geology of Hong Kong

To provide an understanding of the principal components of the geology of Hong Kong and its regional setting, including the distribution and interpretation of the main rock types, age relationships, superficial deposits; and the locations and orientations of the main regional and local structures.

GEOS7035 Intermediate geology

The course introduces mineralogy, petrology, structural geology, and further geological topics for non-geologists who have passed the prerequisite course GEOS7010.

GEOS7036 Innovative technology and environmental sustainability

The course introduces the government policy on the adoption of digital technology and sustainability assessment in public works projects, and provides an understanding of the role of innovative technology and environmental sustainability in engineering practice through case histories and examples.

GEOS8001 Hydrogeology

This course studies the role of sub-surface water in engineering and environmental applications. Topics include the hydrologic cycle, properties of aquifers controlling the transmissivity storage and quality of groundwater, quantification of groundwater flow, the field investigation of groundwater and assessment of field parameters, and applications of hydrogeology in engineering and environmental studies.

GEOS8002 Professional practice in applied geosciences

An examination of issues in professional practice in applied geosciences; including regulation of practice, professional ethics and law, contracts and risk management.

GEOS8003 Seminars on unforeseen ground conditions, geotechnical and environmental failures

A series of student-led seminars on case histories of landslides, collapses of engineering structures, excessive ground settlement and environmental disasters. Presentations of facts and opinions are given by students based on suggested reading material. This course provides a capstone experience.

GEOS8020 Project part II

The second phase of an independent study of a problem in applied geosciences culminating in the preparation of a project report of about 10,000 words. Students will be required to make a presentation of their preliminary results. This course provides a capstone experience.

GEOS8021 Geological fieldwork II

Self-directed study in the field over a 6-month period leading to the production of maps, field sheets, narrative accounts and other geological records for assessment. The fieldwork may be undertaken in association with the excursions of the Department of Earth and Planetary Sciences, the local learned societies or independently.

GEOS8101 Engineering geology and geotechnical design

An examination of civil engineering design methodology and the application of soil mechanics theory and empiricism in geotechnical design. Emphasis is given to soil slopes and embankments, earth pressure and retaining structures, and shallow and deep foundations.

GEOS8102 Rock engineering and applications

This course starts with a brief introduction to the design methodology and the systems approach in rock engineering, and mainly focuses on the collection and analyses of engineering geological data for the design of rock structures. Uses of rock mechanics input and empirical classifications in analysis and design of rock slopes, tunnel excavation and support systems, and rock foundations are demonstrated through case histories.

GEOS8104 Natural hillside landslide and hazard studies

The contents of this course will include most of the following topics: classification of landslides; Hong Kong terminology, examples of natural terrain landslides and documentary sources of information; hillslope evolution, geomorphological principles (including the evolutionary landform models of Dalrymple and Hansen) and Quaternary geology of Hong Kong; hillslope hydrology, modes of groundwater flow, runoff and infiltration, piping; hydrological and morphological conditions for initiation of shallow landslides in regolith; engineering geological and geomorphological mapping; landform processes; regolith mapping, boulder identification; landslide hazard assessment; landslide susceptibility assessment for risk quantification; design event approach; landslide mobility modelling.

GEOS8204 Basic structural mechanics and behaviour

The course covers most of the following topics: 1) Behaviour of structural members subjected to tension, compression, bending, shear and torsion. 2) Buckling of compression members. 3) Statically determinate and indeterminate structures; including the concept of redundancy of structural members. 4) Load transfer mechanisms of structural systems including foundations and shoring systems. 5) General behaviour and basic concepts in design of reinforced concrete members. 6) Structural design of foundations and retaining walls.

GEOS8205 Mathematics I

This course (together with GEOS8206 Mathematics II) strives to provide a comprehensive introduction to the fundamental mathematics that all earth scientists need. Topics include the language of sets, the concept of matrices and its applications, functions, limits, first order differentiation, applications of derivatives, first order Taylor's expansion, properties of exponential and logarithmic functions, the notation of integration,

Programme Highlights

WHAT YOU WILL LEARN

Programme Highlights

integration techniques, volume of revolution, higher order differentiation and Taylor's expansion, Hessian test for functions of two variables, the concept of multiple integration, and volume using triple integration.

GEOS8206 Mathematics II

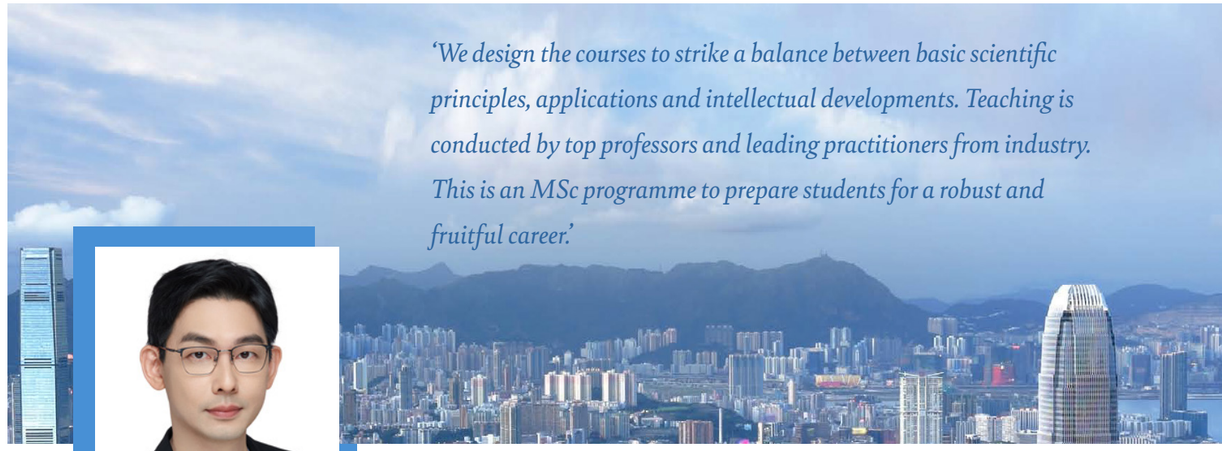
This course is a continuation of GEOS8205 (Mathematics I). The first part of the course aims to teach students different solution methods to first order differential equations (separable, linear, Bernoulli, exact/non-exact types), second order linear differential equations with constant coefficients using characteristic equation, method of variation of parameters, method of educated guess. The second part introduces the concept of probability and statistics, topics include counting, probability (using the language of sets), random variables (including Binomial, Poisson, Exponential, Normal), probability density/ distribution functions, cumulative distribution functions, joint distributions, independence, mean, variance, covariance, moment generating functions, sampling and confidence intervals (using Normal/t- distributions).

GEOS8209 Climate change and society

This course will explore the role of humans in global change and the environment responses to such change. Students will also take a look at human evolution and migration from a paleoenvironmental perspective.

More course information at:
https://www.scifac.hku.hk/prospective/tpg/MSAG

YOUR PROGRAMME EXPERTS



'We design the courses to strike a balance between basic scientific principles, applications and intellectual developments. Teaching is conducted by top professors and leading practitioners from industry. This is an MSc programme to prepare students for a robust and fruitful career.'

Programme Director

Professor Louis N Y WONG
BSc *HKU*; PhD *MIT*; FGS

Associate Programme Director

Professor W K PUN	BBS; BSc *HKU*; MSc *Lond*; DIC; FHKIE

Programme Assistant

Ms Trudy H J KWONG	BSc, MPhil *HKU*; FGS

Programme Advisor

Professor Andrew W MALONE	BBS; BSc *Leeds*; PhD *Lond*; DIC; FGS; FICE

Staff list

Professor Z H LIU	BSc *USTC*; PhD *Brown*
Professor J J JIAO	BEng, MEng *CUG*; PhD *Birmingham;* FHKIE; FGS; FASCE; FGSA
Dr Haz M C CHEUNG	BSc(Hons), MSc *UTA*; PhD *HKU*
Dr Diane CHUNG	MESci *Cardiff*; PhD *HKU*
Dr F L TSANG	BSc *HKU*, MSc *Sydney*, PhD *RUG*

YOUR PROGRAMME EXPERTS

Part-time Lecturers

Professor P W K CHUNG	BSc *HKU*; MSc *Lond*; DIC; CEng; FHKIE; FGS
Mr J HART	BSc *Edin*; MSc *Lond*; C Geol; *GeoRisk Solutions Ltd*
Professor K K S HO	BSc(Eng), ACGI; MSc, DIC; FICE; FHKIE; CEng; RPE(Geotechnical); RPE(Civil); EurIng
Ir I M L HO	BEng, MPhil *HKUST*; MHKIE; MICE; CEng; *GEO*
Ir T H H HUI	BEng *HKU*; MSc *Lond*; *DIC*; MHKIE; *GEO*
Ir K C HUNG	BEng, MSc *HKUST*; LLB *Lond*; MHKIE; MIStructE, MIOM3, CEng; *GEO*
Ms Rita S W HUNG	BBA(Law), LLB, PCLL *HKU*; Solicitor Hong Kong
Ir Florence W Y KO	BEng *HKUST*; LLB *Lond*; MSc *Lond*; DIC; MA *CityU*; MICE; MHKIE; CEng; *GEO*
Ir P C T KWOK	MSc *HKU*; MHKIE; RSE; *Fugro*
Dr P L NG	BEng, PhD *HKU*; MBA; MHKIE; MICE; CEng; RPE; *HKUST*
Dr S W P NG	BSc; MPhil *HKU*; DPhil *Oxon*; FGS; CEP®; SEG; Minersoc; *ASA Tiles HK*; *CUHK*
Ir K STYLES	BSc *UNSW*; CGeol; FGS; FIMMM; CEng; FHKIE; RPE(GEL); *Meinhardt*
Mr A C T SO	BSc *Aberdeen*, MSc *PolyU*; MPhil *HKU*; CGeol; MIOM3; FGS; FGA; FHKICA; *DEVB*
Dr E H Y SZE	BEng, PhD *HKU*; CEng; MICE; MHKIE; RPE; MASCE; *GEO*
Dr Denise L K TANG	BSc, MPhil *HKU*; PhD *Wellington*; *GEO*
Mr E T K TSE	BSc, MSc *HKU*; CGeol; FGS; *GEO*
Mr S J WILLIAMSON	BEng *Portsmouth*, MSc *Birmingham*; CEng; CGeol; MIMMM; FGS; *AECOM*

Admissions

Requirements

Applicants should fulfil the University Entrance Requirements and should possess a Bachelor's degree with First or Second Class Honours (or GPA equivalent) in science, engineering or a related subject.

How to apply

Application opens in **October 2025**

Applications are considered continuously, and early application is advantageous.

Application deadlines (local and non-local applicants):

Round 1: **12:00 noon (GMT +8), January 30, 2026**

Round 2: **12:00 noon (GMT +8), April 30, 2026**

Online application
admissions.hku.hk/tpg/

Expected degree conferment will take place in

Full-time: November / December 2027 (Winter Congregation)
Part-time: November / December 2028 (Winter Congregation)

Further Information

Programme details

t.ly/O2nun

t.ly/Sj7Fj

Support for students

www.cedars.hku.hk/

Enquiries

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HKU Science