

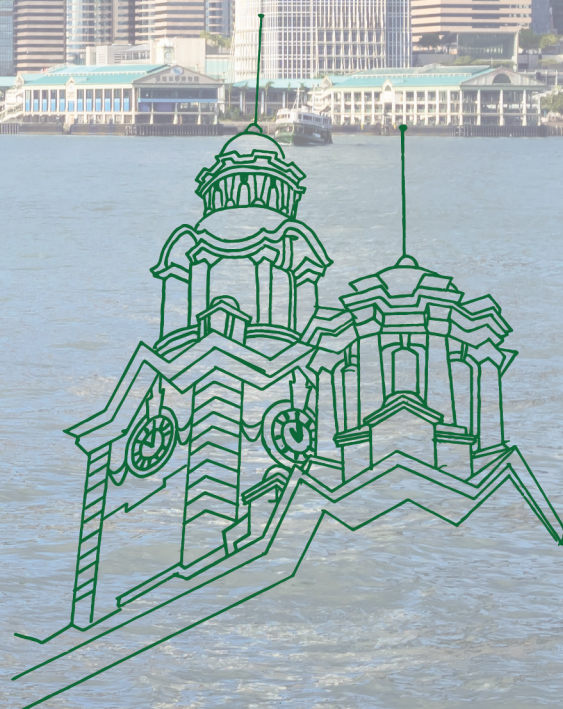


**SHKU** FACULTY OF SCIENCE  
Science THE UNIVERSITY OF HONG KONG  
香港大學理學院

# Master of Science in the field of **APPLIED GEOSCIENCES**

*A springboard for a robust and fruitful career*

**Apply now for entry in September 2022**



SCIENCE CREATES KNOWLEDGE



# IS THE PROGRAMME FOR YOU

Why this Programme

## Two themes are accredited by the Geological Society of London

- Engineering Geology Theme\*
- Engineering Geology with HKIE Approved Courses Theme\*
- Offers courses which graduates in Earth Sciences or Geology would need to meet the entry requirements of the HKIE in the Geotechnical Discipline

\*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)



#22

World Rankings 2021

#4

Asia Rankings 2021

### Times Higher Education (THE)



#30

World Rankings 2022

#4

Asia Rankings 2021

### Eminent Subject Rankings



QS World University Rankings by Subject 2021:

#44

Environmental Sciences

#49

Earth & Marine Sciences

### Top-notch Scientists in the Faculty

Clarivate Analytics' Essential Science Indicators 2020

16.5%

of our professoriate staff are the world's Top 1% scholars

## Engineering Geology Theme

### Focus

- ♦ Application of geology and mechanics in geotechnical engineering
- ♦ Development of geological engineering skills

### Coverage

- ♦ Offers 11 of the additional courses which graduates in Earth Sciences or Geology would need to meet the entry requirements of the Hong Kong Institution of Engineers (HKIE) in the Geotechnical Discipline

## Engineering Geology with HKIE Approved Courses Theme

### Coverage

- ♦ Offers all 14 of the additional courses which graduates in Earth Sciences or Geology would need to meet the entry requirements of the HKIE in the Geotechnical Discipline



### Tuition fees

Composition fee: HK\$145,000\* (subject to approval)

Students are required to pay Caution Money (HK\$350, refundable on graduation subject to no claims being made) and Graduation Fee (HK\$350)



### 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  
• An annual MSc workload of 720 hours is approximately 40% of the working hours of a full-time job



### Class schedule

- Teaching: mainly on weekday evenings
- Students are expected to study year-round and teaching is also conducted during Reading Weeks and Summer Semester
- Field and laboratory work: weekends



### 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

What the Programme Covers

## Professional recognition

- ◇ The two themes offered in 2021 are accredited by the Geological Society of London which awards the qualification of Chartered Geologist
- ◇ Applicants with an accredited MSc can apply for Chartered Geologist with fewer years of working experience
- ◇ 14 courses of the MSc are approved by the HKIE, which are the required additional courses for Earth Sciences or Geology graduates for admission into the HKIE in the Geotechnical Discipline

## 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
- ◇ An internship in industry for selected full-time students
- ◇ A valuable network of industry connections, career advice and inspiration

## Career development

Employers of recent MSc graduates include: Airport Authority, Arup, Arcadis, Atkins, Dragages, Fugro, Gammon, Geotechnical Engineering Office, Jacobs, MTRC, Meinhardt and Vibro

## Scholarships and financial support

- ◇ Association of Geotechnical and Geoenvironmental Specialists (Hong Kong) Scholarship
  - ◇ This \$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 and living allowance on a case-by-case basis
  - ◇ Contact Professor Malone for details
  - ◇ For more detail: <https://www.scholarships.hku.hk/Scholarships/detail/255>



## Prizes

Halcrow Prizes are awarded to the Best Student and 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 geomaterials**



## Host

### Department of Earth Sciences

Since 1995 the Department has focused primarily on the geology of Asia and the Asia Pacific Regions, carrying out cutting-edge frontier research and dealing with fundamental scientific challenges of societal relevance.

Our work on applied geosciences is of importance, considering the highly urbanised setting of Hong Kong and the region. We have made significant contributions in hydrogeology, rock mechanics, engineering geology, geophysics and applied geochemistry.



Engineering geologists who strive to improve their performance in professional work



Earth Sciences or Geology graduates who wish to fulfill the entry requirements of HKIE in the Geotechnical Discipline



Engineers and scientists wanting to advance their understanding of geology and the work of the engineering geologist

### Hear from our graduate



Mohan LIN  
Class of 2018



At HKU I got the chance to learn from world-class professors who have abundant working experience and are willing to share their knowledge. My MSc included an internship in Arup and on graduating I got a job in Hong Kong with Fugro.





# WHAT YOU WILL LEARN

## Programme structure

The design of the curriculum of the Engineering Geology theme (part-time)					
Semester	Mechanics	Engineering	Integrated studies	Geology	
4 <sup>th</sup>		Rock engineering GEOS8102	Dissertation project GEOS8020 Seminars GEOS8003		15
3 <sup>rd</sup>		Geotechnical engineering GEOS8101	Professional practice GEOS8002 Dissertation project GEOS8020	Landslide studies GEOS8104 (To be confirmed)	18
2 <sup>nd</sup>	Structures GEOS8204	Site investigation GEOS7012	Dissertation project GEOS7020	Geological fieldwork GEOS8021	15
1 <sup>st</sup>	Rock & soil mechanics GEOS7015 GEOS7016 Hydrogeology GEOS8001			Geology of HK GEOS7011	18
	12	18	24	12	credits
66 credits core courses (for Geologists)					

## Engineering Geology theme (66 credits)

### Core courses

GEOS7010 Geology principles and practice (6 credits), for non-geologists  
 GEOS7011 Advanced geology of Hong Kong (6 credits), for geologists **OR**  
 GEOS7033 Geology of Hong Kong (6 credits), for non-geologists  
 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), for non-geologists **OR**  
 GEOS8021 Geological fieldwork II (3 credits), for geologists  
 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 geomaterials (6 credits)  
 GEOS8104 Natural hillside landslide and hazard studies (3 credits)\* (To be confirmed)  
 GEOS8204 Basic structural mechanics and behaviour (3 credits)<sup>†A</sup>

### Elective course

GEOS7022 Course of directed studies (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.

**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.

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 geologists

<sup>†</sup> Graduates in Civil Engineering cannot take this course for credits

<sup>A</sup> Not a core course for non-geologists and full-time students taking course GEOS7022



## Programme structure

The design of the curriculum of the Engineering Geology with HKIE Approved Courses theme (part-time)					
Semester	Mechanics	Engineering	Integrated studies	Maths and management	
4 <sup>th</sup>		Rock engineering GEOS8102	Dissertation project GEOS8020 Seminars GEOS8003		15
3 <sup>rd</sup>	Hydrogeology GEOS8001	Geotechnical engineering GEOS8101	Professional practice GEOS8002 Dissertation project GEOS8020		18
2 <sup>nd</sup>	Structures GEOS8204	Site investigation GEOS7012	Dissertation project GEOS7020	Mathematics II GEOS8206	18
1 <sup>st</sup>	Rock & soil mechanics GEOS7015 GEOS7016			Mathematics I GEOS8205 Management GEOS7024	18
	12	18	24	15	credits
69 credits core courses					

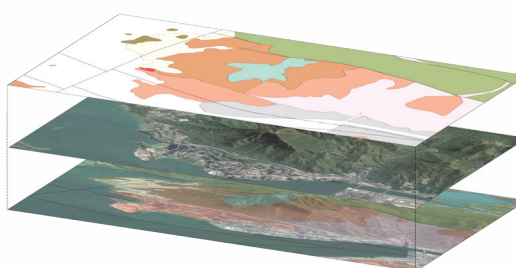
## Engineering Geology with HKIE Approved Course Theme (69 credits)

### 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 geomaterials (6 credits)  
 GEOS8204 Basic structural mechanics and behaviour (3 credits)  
 GEOS8205 Mathematics I (6 credits)  
 GEOS8206 Mathematics II (6 credits)

### Remarks:

1. The programme structure will be reviewed from time to time and is subject to change
2. 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



## Description of Selected Course (Provisional)

### GEOS7011 Advanced geology of Hong Kong

This advanced course examines specialist aspects of the rocks and geological formations and structures of Hong Kong and their significance in the context of geotechnical engineering, environmental management and resource development. Topics include volcanic and granitic rocks, sedimentary and metamorphic rocks, weathering processes, superficial deposits, geology 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 classification, ground investigation technology and 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 underlying soil mechanics theory used in geotechnical practice. The course reviews phase relationships, soil classification, compaction, fluid flow and effective stress concepts; and provides a more detailed analysis of elasticity, shear strength and consolidation.

### GEOS7024 Management

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

### GEOS8001 Hydrogeology

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

### 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.

### 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 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 geomaterials

This course gives a brief introduction to the design methodology and systems approach in rock engineering, focusing on the analysis of engineering geological data in designing rock structures. Uses of rock mechanics input, empirical classifications in analysis, design of rock slopes, tunnel excavation and support systems are illustrated with cases.

### GEOS8204 Basic structural mechanics and behaviour

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

### GEOS8205 and 8206 Mathematics I & II

These courses strive to provide a comprehensive introduction to the fundamental mathematics that all earth scientists need.

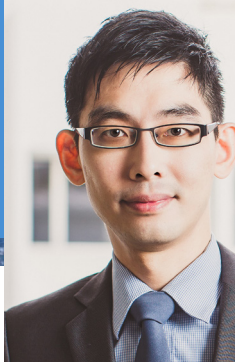
**See the prospectus for full information of the courses:**

[https://www.earthsciences.hku.hk/f/upload/1096/Applied%20Geoscience\\_Prospectus\\_2022%20updated.pdf](https://www.earthsciences.hku.hk/f/upload/1096/Applied%20Geoscience_Prospectus_2022%20updated.pdf)





# 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

**Dr Louis N Y WONG**

BSc HKU; PhD MIT; FGS

## Programme Admission Advisor

**Professor Andrew W MALONE**

BBS; BSc Leeds; PhD Lond; FGS; FICE; CEng

## Associate Programme Director

**Professor Y C CHAN**

BBS; BSc HKU; MSc Lond; DIC; FHKIE; MStructE

## Part-time Lecturers

**Ir I H H CHAN**

MSc HKUST; BEng HKUST; MICE; MStructE; MHKIE; GEO

**Professor P W K CHUNG**

JP; BSc HKU; MSc Lond; DIC; CEng; FHKIE; FGS; GEO

**Mr J HART**

BSc Edin; MSc Lond; C Geol; GeoRisk Solutions Ltd

**Professor K K S HO**

JP; BSc (Eng), ACGL; MSc Lond; DIC; FICE; FHKIE; CEng, RPE (Geotechnical), RPE (Civil); Eurlng; GEO

**Ir I M L HO**

BEng, MPhil HKUST; MHKIE; MICE; CEng; GEO

**Mr B P HOY**

LLB; Solicitor Hong Kong, Robertsons

**Ir Florence W Y KO**

BEng HKUST; LLB Lond; MSc Lond; DIC; MA HKCityU; MICE; MHKIE; CEng; GEO

**Dr Vickie W W KONG**

BEng, MEng Auckland; PhD UWA; MICE; MHKIE; CEng; GEO

**Ir P C T KWOK**

MSc HKU; MHKIE; RSE; Fugro

**Mr M H Y LAM**

LLB, LLM; FCIArb; Solicitor Hong Kong; Clyde & Co

**Professor R P MARTIN**

BSc, PhD Lond; CEng; CGeol; FHKIE; FIMMM; Geoconsult HK

**Ir S MILLIS**

BSc Staff; MSc Leeds; CGeol; CEng; MIMMM; MHKIE; FGS; Arup

**Dr S W P NG**

BSc, MPhil HKU; DPhil Oxon; FGS; SEG; MinSoc; CUHK

**Dr P L NG**

BEng, PhD HKU; MBA; MHKIE; MICE; CEng; RPE; Hip Hing Construction Co Ltd

**Professor R J SEWELL**

BSc, PhD Cant; FGS; CGeol; CSci; Eur. Geol; AGU; GEO

**Ir K STYLES**

BSc UNSW; CGeol; CEng; FHKIE; Fugro

**Dr Tammy P Y TAM**

BSc, PhD HKU; CUHK

**Mr M I WALLACE**

BSc Glasgow; MSc Durham; CGeol; Arup

## Admissions

### Requirements

Applicants 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 2021**

Non-local applications deadline: **12 noon (HKT), April 29, 2022**

Local applications deadline: **12 noon (HKT), May 31, 2022 (extended)**

Full-time students wishing to take internship should apply early

### Online application



[admissions.hku.hk/tpg/](https://admissions.hku.hk/tpg/)

## Further Information

### Programme details



[bit.ly/2uw5uvP](https://bit.ly/2uw5uvP)



[bit.ly/37XgK5F](https://bit.ly/37XgK5F)

### Support for students



[www.cedars.hku.hk/](https://www.cedars.hku.hk/)

### Enquiries

#### Department of Earth Sciences

Tel: (852) 2859 1084 E-mail: [earthsci@hku.hk](mailto:earthsci@hku.hk)

#### Programme Admissions Advisor

Professor Andrew MALONE

Tel: (852) 2559 2555 E-mail: [awmalone@hku.hk](mailto:awmalone@hku.hk)

#### Programme Director

Dr Louis N Y WONG


Tel: (852) 2241 5970 E-mail: [lnywong@hku.hk](mailto:lnywong@hku.hk)

#### Associate Programme Director

Professor Y C CHAN

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