Master of Science in the field of
Applied Geosciences
Apply now for entry in September 2019
Professional Recognition

The Engineering Geology Theme and the Engineering Geology with HKIE Approved Courses Theme of the MSc in Applied Geosciences are accredited by the Geological Society of London, the body which awards the qualification Chartered Geologist. Applicants with an accredited MSc need fewer years of working experience to apply for Chartered Geologist.

Fourteen courses of the MSc in Applied Geosciences are approved by the Hong Kong Institution of Engineers. These are the additional courses which graduates in Earth Sciences or Geology would need to meet the entry requirements of the HKIE in the Geotechnical Discipline.

Careers

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

What will this MSc give you?

• The chance to work with top professors and leading practitioners from industry
• Technical knowledge and professional skills you can apply wherever in the world you are working
• An internship in industry for selected full-time students
• A valuable network of industry connections, career advice and inspiration

Scholarships and Financial Support

Association of Geotechnical and Geoenvironmental Specialists (Hong Kong) Scholarship

This $10,000 scholarship is awarded annually on the basis of academic achievement.

Government’s Non-means Tested Loan Scheme

https://www.wfsfaa.gov.hk/

Prizes

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

Courses Reimbursable by the Continuing Education Fund (CEF)

Courses in the programme:

• GEOS7012 Site Investigation and engineering geological techniques
• GEOS8101 Engineering geology and geotechnical design
• GEOS8102 Rock engineering and geomaterials

are reimbursable courses for the purposes of CEF.

Target Students

• Engineering Geology Theme

Aim: to help engineering geologists improve their performance in professional work. Engineers and scientists wanting to advance their understanding of geology and the work of the engineering geologists are also invited to apply for admission. The theme concentrates on the application of geology and mechanics in geotechnical engineering and the development of engineering geological skills.

• Engineering Geology with HKIE Approved Courses Theme

Provides all 14 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 in the Geotechnical Discipline.

The MSc really helped me to understand how to approach engineering geological problems. It built up my confidence as a young geologist in dealing with other professionals. I believe this is the best course of its type in East and Southeast Asia.”

ABD Rasid Jaapar (MScAG 2006)
Managing Director, Geomapping Technology Sdn Bhd
President, Geological Society of Malaysia

“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.”

LIN Mohan (MScAG 2018)
BSc Geology, Tongji University 2017
Assistant geologist, Fugro

“This MSc programme not only contains valuable subject matter, but also provides priceless opportunities to infuse the wisdom from the best minds in the field. I attribute much of my vocational achievement to this MSc programme, as it helps me to become a more effective and efficient Engineer.”

Peter CHING (MScAG 2001)
Principal Manager Geotechnical, Third Runway Division, Airport Authority HK

“The MSc programme helped me to establish the foundation for my professional career by developing practical analytical skills, a research-oriented view and a strong understanding of the engineering geology environment in Hong Kong, which I can rely on confidently, on a daily basis.”

Janice CHOI (MScAG 2010)
Assistant resident engineer, AECOM

“The MSc delivered both theoretical and practical knowledge in the field of engineering geology. This knowledge proved to be very valuable in my career in contractor and consultant firms.”

CAIM CHAN (MScAG 2015)
Engineering geologist, Colders

“The MSc program helped me to become a better geologist. We received the most comprehensive and state-of-the-art training from experts in academic, government and private sectors. It was hard work but I will never regret my efforts!”

Xavier SHUM (MScAG 2017)
Assistant geologist, Fugro

“The MSc developed my technical knowledge and critical thinking skills, which helps me deal with engineering geological problems more effectively in a global environment.”

Olivia LAM (MScAG 2017)
International management trainee, Fugro

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Programme Structure

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.

**Engineering Geology Theme (66 credits)**

**Core courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOS7010</td>
<td>Geology principles and practice (6 credits), for non-geologists</td>
<td></td>
</tr>
<tr>
<td>GEOS7011</td>
<td>Advanced geology of Hong Kong (6 credits), for geologists OR Geologists</td>
<td></td>
</tr>
<tr>
<td>GEOS7012</td>
<td>Site Investigation and engineering geological techniques (6 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS7015</td>
<td>Rock mechanics (3 credits)</td>
<td></td>
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<tr>
<td>GEOS7020</td>
<td>Project Part I (6 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS7021</td>
<td>Geological Fieldwork I (6 credits), for non-geologists OR Geologists</td>
<td></td>
</tr>
<tr>
<td>GEOS8001</td>
<td>Hydrogeology (5 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS8002</td>
<td>Professional practice in applied geosciences (3 credits)</td>
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<tr>
<td>GEOS8005</td>
<td>Geotechnical and Environmental Failures (5 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS8012</td>
<td>Engineering geology and geotechnical design (6 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS8016</td>
<td>Rock engineering and geomaterials (6 credits)</td>
<td></td>
</tr>
<tr>
<td>GEOS8020</td>
<td>Geotechnical Fieldwork II (3 credits), for geologists</td>
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**Elective courses**

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOS7022</td>
<td>Course of directed studies (3 credits)</td>
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</tbody>
</table>

Certain other courses may be accepted as electives at the discretion of the programme director.

- For geologists
- Not a core course for full-time students taking course GEOS7022
- Graduates in Civil Engineering cannot take this course for credits.

The design of the curriculum of the Engineering Geology theme (part-time)

<table>
<thead>
<tr>
<th>Term</th>
<th>Mechanics Course Code</th>
<th>Engineering Course Code</th>
<th>Integrated Studies Course Code</th>
<th>Geology Course Code</th>
</tr>
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<tr>
<td>4th</td>
<td>GEOS7012</td>
<td>GEOS7015</td>
<td>GEOS7020</td>
<td>GEOS7011</td>
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<tr>
<td>5th</td>
<td>GEOS7016</td>
<td>GEOS7022</td>
<td>GEOS7024</td>
<td>GEOS7021</td>
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<tr>
<td>6th</td>
<td>GEOS7020</td>
<td>GEOS7023</td>
<td>GEOS7025</td>
<td>GEOS7022</td>
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<td>GEOS7025</td>
<td>GEOS7022</td>
</tr>
</tbody>
</table>

Study Load

To complete the MSc curriculum students are required to pass courses amounting to 66 or 69 credits. Learning hours will amount to approximately 1440 hours, including about 360 hours for the Project, and contact hours will be about 400 hours. The 2-year part-time programme of studies imposes a heavy workload on a part-time student in a full-time job - an annual MSc workload of 720 hours is approximately forty percent of the number of working hours of a full-time job. Students are expected to work year-round and teaching is conducted during Reading Weeks and in the summer semester.
In view of the wealth of historical air photography in Hong Kong but lack of an affordable guidance manual, I was inspired to write my MSc dissertation on application of aerial photography in geotechnical practice. We then published the HK API guide in 2006.”

Ho Hoi Yan (MSAC 2004)
Arup, GEO
GEOS8201   Geological fieldwork II (3 credits) (18 hrs fws)
Course coordinator: Dr Jess King
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. (Marked on a Pass/Fail basis.)
Assessment: Course work (100%)

GEOS8101   Engineering geology and geotechnical design (6 credits)
(56 hrs lec + tut)
Course Coordinator: Prof A W Malone (taught by Prof Philip Chung, Dr Vickie Kong and Prof Malone)
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.
Assessment: Course work (50%) and written examination (70%)
Pre-requisite: GEOS7016

GEOS8102   Rock engineering and geomaterials (6 credits)
(56 hrs lec + tut)
Course Coordinator: Dr Louis N Y Wong (taught by Dr Wong and Ir Patrick Chau)
This course starts with a brief introduction to the design methodology and the systems approach in rock engineering, and is mainly focused on the collection and analysis 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.
Assessment: Course work (50%) and written examination (70%)
Pre-requisite: GEOS7015

GEOS8104   Natural Hillside Landslide and Hazard Studies (3 credits)
(18 hrs lec + tut)
Course coordinator: Mr Jonathan Hart (taught by Mr Hart and Prof R P Martin)
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,oulder identification; landslide hazard assessment; landslide susceptibility assessment for risk quantification; design event approach; landslide mobility modelling.
Assessment: Course work (50%) and written examination (70%)

GEOS8204   Basic structural mechanics and behaviour (3 credits)
(18 hrs lec + tut)
Course coordinator and teacher: Ir Philip C T Kwok
The subject will cover most of the following: 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.
Assessment: Course work (50%) and written examination (70%)

GEOS8205   Mathematics II (6 credits) (36 hrs lec + tut)
Course coordinator and teacher: Dr F L Tang
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, 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.
Assessment: Course work (50%) and written examination (70%)

GEOS8206   Mathematics I (6 credits) (36 hrs lec + tut)
Course coordinator and teacher: Dr F L Tang
This course together with GEOS8205 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, 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.
Assessment: Course work (50%) and written examination (70%)

Notes:
lec: Lecture; tut: Tutorial; fws: Fieldwork supervision; dis: Dissertation supervision; pro: Project supervision

Programme Duration and Class Schedules
The part-time programme extends over two academic years of part-time study and the full-time programme extends over one academic year. Teaching will take place mainly on weekday evenings but students are expected to undertake field and laboratory work during weekends. Normally there are two evening classes each week but in some semesters there will be three. Full-time students attend the same evening classes as part-time students, most of whom have day-time employment. Concentrated teaching may be held at weekends. All lectures are given in English at the HKU main campus.
Tuition Fees
The annual composition fee for the academic year 2019-20 is HK$130,000#. Part-time students will pay HK$65,000# per year for two years. Payment can be paid in two instalments each year.

# Subject to approval

Admission Requirements
Applicants should possess a Bachelor’s degree with First or Second Class Honours (or GPA equivalent) in Science, Engineering or a related subject.

Application
Application for full-time and part-time study opens in December 2018
Round 1 deadline January 31, 2019
Round 2 (clearing) deadline 12:00noon, April 30, 2019

Full-time students wishing to take an internship as part of their programme should apply early.

Online application
https://aal.hku.hk/tpg

Validity
This booklet was prepared in November 2018 and information in it may have been superseded by subsequent changes.

Part-time Lecturers
Ir P K S Chau BEng, MEng McGill, MHKIE, MIOM3, CEng; PEng (Ont) GEO
Prof P W K Chung BSc, HKU; MSc Lond, DIC, CEng; MHKIE; FGS GEO
Mr J Hart BSc Edin, MSc Lond, CGeol GeoRisk Solutions Ltd
Ir I M L Ho BEng MPhil HKUST, MHKIE, MICE; CEng GEO
Mr B P Hoy Solicitor Hong Kong, Robertsons
Ir Florence W Y Ko BEng Hong Kong, MSc IC; 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 BEng HKUST, MSc, MICE; RSE Caritas
Mr M H Y Lam Solicitor Hong Kong, Clyde & Co
Prof R P Martin BSc PhD Lond, MIMM, CEng, CGeol Geoconsult HK
Prof R J Sewell PhD Cantab HK Geological Survey GEO
Ir K Styles BSc UNSW, CGeol, CEng; FHKIE Fugro

Further Information
Programme details can be downloaded from
https://www.scifac.hku.hk/prospective/tpg/about
https://www.earthsciences.hku.hk/current-students/postgraduate-students/taught-postgraduates