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 geologist 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. Provides 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 in the Geotechnical Discipline.

- 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.

What our students say
"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

"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

"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 be 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 program helped me to be a better geologist. It 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)
Engineer, Golder

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

"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
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
- **GEOS7010** Geology principles and practice (6 credits), for non-geologists
- **GEOS7011** Advanced geology of Hong Kong (6 credits), for geologists
- **GEOS7015** Geology of Hong Kong (6 credits), for non-geologists
- **GEOS7012** Site Investigation and engineering geological techniques (6 credits)
- **GEOS7016** "Soil mechanics (3 credits)
- **GEOS7020** Project Part I (6 credits)
- **GEOS7021** Geological Fieldwork I (3 credits), for non-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)

#### Elective courses
- **GEOS7022** Course of directed studies (3 credits)

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.

### 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)
- **GEOS7021** Geological Fieldwork I (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)

+ subject to approval

The design of the curriculum of the Engineering Geology with HKIE Approved Courses theme for Geologists (part-time)

<table>
<thead>
<tr>
<th>Term</th>
<th>Mechanics</th>
<th>Engineering</th>
<th>Integrated Studies</th>
<th>Geology</th>
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<tbody>
<tr>
<td>4th</td>
<td>Rock engineering GEOS8010</td>
<td>Dissertation project GEOS8020</td>
<td>Geoelectric seminar GEOS8001</td>
<td>18 credits</td>
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<tr>
<td>3rd</td>
<td>Geotechnical engineering GEOS8010</td>
<td>Prof practice GEOS8001</td>
<td>Landslide studies GEOS8004</td>
<td>15</td>
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<tr>
<td>2nd</td>
<td>Structures GEOS8004 Hydrogeology GEOS8001</td>
<td>Site investigation GEOS8012</td>
<td>Geodetic Fieldwork GEOS8010</td>
<td>18</td>
</tr>
<tr>
<td>1st</td>
<td>Soil &amp; Rock mechanics GEOS8010 GEOS8016</td>
<td>Geology of HK GEOS8011</td>
<td>Geoelectric seminar GEOS8001</td>
<td>15</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 (MScAG 2004)
Arup, GEO
The contents of this course will include most of the following topics:
- First order Taylor's expansion
- Properties of exponential and logarithmic functions
- The concept of matrices
- Functions, limits, first order differentiation, applications
- The language of sets, the concept of matrices and its applications
- Method of educated guess
- The basic concepts in design of reinforced concrete
- 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/- distributions.

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

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

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Ir I M L Ho
BEng MPhil HKUST; MHKIE; MICE; CEng GEO

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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