Master of Science in the field of

APPLIED GEOSCIENCES

A springboard for a robust and fruitful career

Apply now for entry in September 2021
**IS THE PROGRAMME FOR YOU**

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.

**World-class Rankings of HKU**

- Quacquarelli Symonds (QS)
  - World Rankings 2021: #22
  - Asia Rankings 2020: #3

- Eminent Subject Rankings
  - QS World University Rankings by Subject 2020:
    - #51 Environmental Sciences
    - #50 Earth & Marine Sciences

**Times Higher Education (THE)**

- World Rankings 2020: #35
- Asia Rankings 2020: #4

**Top-notch Scientists in the Faculty**

- Clarivate Analytics’ Essential Science Indicators 2019
  - 15.4% 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 HKIE in Geotechnical Discipline

**Tuition fees**
- Composition fee: HK$140,000
- 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
- Field and laboratory work: weekends
- Students are expected to work year-round 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
Professional recognition
- The two themes of the MSc 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 MScs are approved by HKIE, which are the required additional courses for Earth Sciences or
  Geology graduates for the entry of HKIE in Geotechnical Discipline

Network and transferable skills
- The chance to work with 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 Non-means Tested Loan Scheme
  - https://www.wfsfaa.gov.hk/
- 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 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 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 focus on applied geosciences is of vital importance, considering the highly urbanised setting of Hong Kong and associated geological
problems. We have made significant strides in hydrogeology, rock mechanics, engineering geology, geophysics and applied geochemistry,
with emphasis on the understanding of groundwater supply and engineering. Our work provides practical solutions to the mitigation of
environmental problems.

Engineering geologists who strive to improve
their performance in professional work

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

Hear from our graduate
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.

Mohan LIN
Class of 2018
### The design of the curriculum of the Engineering Geology theme (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>1st</td>
<td>Rock &amp; Soil mechanics</td>
<td><strong>Geology of HK</strong> GEOS7011</td>
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<td></td>
<td>GEOS7015 GEOS7016</td>
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<td>2nd</td>
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<td>Site investigation GEOS7012</td>
<td>Dissertation project GEOS8020</td>
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<td>Geotechnical engineering GEOS8101</td>
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<td>Geotechnical engineering GEOS8101</td>
<td>Professional practice GEOS8002 Dessertaion project GEOS8020</td>
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<td>Landslide studies GEOS8104</td>
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<td>4th</td>
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<td>Rock engineering GEOS8102</td>
<td>Dissertation project GEOS8020</td>
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</table>
### Programme structure

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

<table>
<thead>
<tr>
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<th>Maths and management</th>
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<td>Dissertation project</td>
<td>Mathematics II</td>
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<td>GEOS8102</td>
<td>GEOS8020 Geos8003</td>
<td>GEOS8206</td>
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<tr>
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<td>Geotechnical engineering</td>
<td>Professional practice</td>
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<td>GEOS7015</td>
<td>GEOS7016</td>
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</tbody>
</table>

12 18 24 15 credits

66 credits core courses (for Geologists)

### 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. Certain courses may be accepted as electives at the discretion of the Programme Director.
2. To be eligible for the award of the MSc in the field of Applied Geosciences, a student shall complete all core course and total credits prescribed in a selected theme.
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 subject provides the graduate with basic knowledge of project management practice. It will cover most of the following: 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 geoscience; 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. (Marked on a Pass/Fail basis.)

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 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.

GEOS8205 & 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
“We design the courses to strike a balance between basic scientific principles, applications and intellectual development. Teaching is 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
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 **November 2020**
Deadline for round 1: **12:00 noon (GMT +8), January 29, 2021**
Deadline for round 2: **12:00 noon (GMT +8), April 30, 2021**
Full-time students wishing to take internship should apply early

Online application

[QR Code Link]

Further Information

Programme details

[QR Code Links]

Enquiries

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**Associate Programme Director**
Professor Y C CHAN
Tel: (852) 2857 8247  E-mail: ycycchan@hku.hk