**Professional Recognition**

The MSc in Applied Geoscience program was recognized as a Challenging Course by the Hong Kong Institution of Engineers (HKIE) for contributing to the professional education of geoscientists. The program is also recognized by the Government of the Hong Kong Special Administrative Region through the Continuing Education Fund (CEF). This recognition aims to encourage students to continue their professional development and contribute to the advancement of the field.

**Prizes**

Fees are reimbursed to the Goldschmidt Prize and are awarded to the best Student and for the best Dissertation.

**Courses Reimburseable by the Continuing Education Fund (CEF)**

- **GEOS7010 Geology principles and practice (6 credits)**
- **GEOS7015 Rock mechanics (3 credits)**
- **GEOS7016 Earth and geological processes (6 credits)**
- **GEOS7020 Project Part I (6 credits)**
- **GEOS7022 Geotechnical and environmental failures (3 credits)**
- **GEOS7023 Engineering geology and solid waste disposal (3 credits)**
- **GEOS7024 Site development (6 credits)**
- **GEOS7025 Rock engineering and rock mechanics (6 credits)**
- **GEOS7026 Project Part II (12 credits)**
- **GEOS8003 Seminars on unforeseen ground conditions, construction site safety, health and environmental aspects; quality control processes, programming and procurement strategies; contract management; risk identification, assessment, insurance and international project management practice. It will cover most of the following: engineering geological problems. It built up my confidence as an Engineer.
Professional Recognition

The Engineering Geology Theme offers an Engineering Geology with MSc (Applied Geoscience) as a core course and Engineering Geology with an MSc in Professional Recognition as a core course. Applicants with an accredited degree will be assessed and may be eligible for recognition of credits for similar courses at other institutions. Applicants with an accredited degree will be assessed and may be eligible for recognition of credits for similar courses at other institutions.

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 on a selected theme.

Engineering Geology Theme MSc credit

Course code | Course title | Credits
--- | --- | ---
GEOS7010 | The course introduces the basic concepts of rock mechanics used in geotechnical and environmental failures | 3 credits
GEOS7011 | Advanced geology of Hong Kong | 6 credits
GEOS7012 | Site investigation and engineering geological techniques | 3 credits
GEOS7013 | Rock mechanics I | 3 credits
GEOS7014 | Site investigation and engineering geological techniques | 3 credits
GEOS7015 | Rock mechanics II | 3 credits
GEOS7016 | Soil mechanics | 3 credits
GEOS7017 | Basic structural mechanics and behaviour | 3 credits
GEOS7018 | Advanced Structural Mechanics | 6 credits
GEOS7020 | Project Part I | 6 credits
GEOS7021 | Engineering geology and engineering design I | 6 credits
GEOS7022 | Course of directed studies | 3 credits
GEOS7024 | Management | 3 credits
GEOS7030 | Research project | 18 credits
GEOS7031 | Research project | 18 credits
GEOS7032 | Course of directed studies I | 3 credits
GEOS8001 | Geotechnical and environmental failures | 3 credits
GEOS8002 | Professional practice in applied geosciences (3 credits) | 3 credits
GEOS8003 | Seminars on unforeseen ground conditions, engineering structures, excessive ground settlement and environmental risk management. | 3 credits
GEOS8004 | Geotechnical and environmental failures (3 credits) | 3 credits
GEOS8005 | Research project | 18 credits
GEOS8006 | Research project | 18 credits
GEOS8007 | Course of directed studies II | 3 credits
GEOS8008 | Rock mechanics and engineering design I | 6 credits
GEOS8009 | Rock mechanics II | 3 credits
GEOS8010 | Soil mechanics | 3 credits
GEOS8011 | Basic structural mechanics and behaviour | 3 credits
GEOS8012 | Advanced Structural Mechanics | 6 credits
GEOS8013 | Research project | 18 credits
GEOS8014 | Research project | 18 credits
GEOS8015 | Course of directed studies III | 3 credits

Study Load

To complete the MSc curriculum, students are required to pass courses amounting to 18 credits in total. The first phase of the independent self-directed study of a problem in applied geosciences is 6 months in the summer semester. The second phase of an independent self-directed study of a problem in applied geosciences is 6 months in the winter semester.

Study Load

In the summer semester, students are required to pass courses amounting to 18 credits in total. The first phase of the independent self-directed study of a problem in applied geosciences is 6 months in the summer semester. The second phase of an independent self-directed study of a problem in applied geosciences is 6 months in the winter semester.
Professional Recognition

The MSc in Applied Geosciences equips毕业生 with fundamental knowledge and skills in geotechnical engineering and environmental geosciences. This course provides high-quality training in environmental geosciences and geotechnical engineering. Students can choose to specialize in either geotechnical engineering or environmental geosciences. The course aims to equip students with the knowledge and skills necessary for careers in these fields. The program is suitable for students who wish to pursue careers in government departments, private companies, or consultancy firms. The program is also offered in a full-time mode for full-time students and in a part-time mode for working professionals. The program is designed to be flexible and accommodate the needs of students from different backgrounds. The program is offered in the summer semester. The program is designed to be flexible and accommodate the needs of students from different backgrounds. The program is offered in the summer semester. The program is designed to be flexible and accommodate the needs of students from different backgrounds. The program is offered in the summer semester.
Course Coordinator: Mr Jonathan Hart (taught by Mr Hart and Mr B Hoy)

GEOS8104 Natural Hillside Landslide and Hazard Studies (3 credits)

Pre-requisite: GEOS7015

Assessment: Course work (30%) and written examination (70%)

This course starts with a brief introduction to the design methodology and the systems approach in rock engineering, and is mainly focused on the design of rock slopes. The course will cover stability and design of rock slopes, tunnel excavation and support systems, and rock foundations. The systems approach is demonstrated through case histories.

Assessment: Course work (60% and written examination (40%)

An examination of civil engineering design methodology and the application of mathematical tools and methods in rock engineering design. Slopes, piles, bored and driven piles, retaining walls on slopes, and offshore platforms will be considered. Grazing and seismic stability, loads and seismic design are covered.

Assessment: Course work (50%) and written examination (50%)

A comprehensive introduction to the fundamental mathematics that all earth scientists need. Topics include the language of sets, the concept of matrices and determinants of matrices, properties of linear equations, matrices, linear independence, vector spaces, inner products, and Gram-Schmidt orthonormalization. Functions of several variables, partial derivatives, tangent planes, optimization, and Lagrange multipliers will also be covered.

Assessment: Course work (50%) and written examination (50%)

This part of the course aims to teach students different solution methods to ordinary differential equations. The main topics covered in this part of the course are: Series solutions, Frobenius method, Sturm-Liouville problems, the Laplace transform, Fourier series, and the method of separation of variables. Laplace transforms are used as a tool for solving linear differential equations with constant coefficients.

Assessment: Course work (30%) and written examination (70%)

The purpose of this course is to introduce students to probability and statistics. The course will cover probability distributions, moments, sampling and sampling distributions, hypothesis testing, nonparametric tests, regression and correlation, analysis of variance, and design of experiments.
This course starts with a brief introduction to the design methodology and the systems approach to civil engineering, and focuses on the basic principles and techniques of civil engineering design. It introduces the fundamental concepts of the design process, including the importance of client needs, project constraints, and the use of appropriate design criteria and tools. The course covers the design of various types of civil engineering structures, such as roads, bridges, tunnels, and waterways. The course also addresses the importance of safety, economy, and sustainability in civil engineering design.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS7015

Course Coordinator: Mr Jonathan Hart (taught by Mr Hart and Ir Patrick Chau)

GEOS8101 Engineering geology and geotechnical design (6 credits)

This course is designed to provide students with a comprehensive understanding of the principles and techniques of engineering geology and geotechnical design. The course covers the basic concepts and principles of soil mechanics, rock mechanics, and soil-structure interaction, as well as the design of foundations and retaining structures. It also provides students with an understanding of the role of geology in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS7015

Course Coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8102 Rock engineering and geomaterials (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of rock engineering and geomaterials. The course covers the basic concepts and principles of rock mechanics, rock failure, and the design of rock slopes. It also provides students with an understanding of the role of rocks in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS7015

Course Coordinator: Professor A W Malone (taught by Professor Philip C T Kwok, Professor R P Martin, Professor P W K Chung, Ir K Styles, Ir P C T Kwok, Professor P L Ng, Professor Y C Chan, Professor W K Chung, Professor Y L A Leung, and Dr P L Ng)

GEOS8021 Geological fieldwork II (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of geological fieldwork. The course covers the basic concepts and principles of geological mapping and field investigation, as well as the production of geological maps and reports. It also provides students with an understanding of the role of geological fieldwork in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8020

Course Coordinator: Ir Florence W Y Ko (taught by Ir Florence W Y Ko and Professor A W Malone)

GEOS8204 Basic structural mechanics and behaviour (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of basic structural mechanics and behaviour. The course covers the basic concepts and principles of structural mechanics, including the equations governing the behaviour of structures, and the analysis and design of structural elements. It also provides students with an understanding of the role of structural mechanics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor Y C Chan)

GEOS8205 Mathematics I (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of mathematics. The course covers the basic concepts and principles of calculus, linear algebra, and probability and statistics. It also provides students with an understanding of the role of mathematics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8021

Course coordinator and teacher: Dr F L Tsang

GEOS8206 Mathematics II (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of mathematics. The course covers the basic concepts and principles of calculus, linear algebra, and probability and statistics. It also provides students with an understanding of the role of mathematics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Course coordinator and teacher: Dr F L Tsang

GEOS8207 Advanced mathematics for civil engineers (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced mathematics for civil engineers. The course covers the basic concepts and principles of advanced mathematics, including the use of mathematical tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced mathematics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8206

Course coordinator and teacher: Dr F L Tsang

GEOS8208 Probability and statistics for civil engineers (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of probability and statistics. The course covers the basic concepts and principles of probability and statistics, including the use of probability and statistical tools and techniques in civil engineering design. It also provides students with an understanding of the role of probability and statistics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8207

Course coordinator and teacher: Dr F L Tsang

GEOS8209 Basic geological principles (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of basic geological principles. The course covers the basic concepts and principles of geological processes and the formation of geological materials. It also provides students with an understanding of the role of geological processes in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8021

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8301 Rock mechanics and behaviour (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of rock mechanics and behaviour. The course covers the basic concepts and principles of rock mechanics, including the equations governing the behaviour of rock materials, and the analysis and design of rock structures. It also provides students with an understanding of the role of rock mechanics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8204

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor Y C Chan)

GEOS8302 Advanced geological and geotechnical engineering (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced geological and geotechnical engineering. The course covers the basic concepts and principles of advanced geological and geotechnical engineering, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced geological and geotechnical engineering in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8205

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8303 Geotechnical engineering and soil mechanics (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of geotechnical engineering and soil mechanics. The course covers the basic concepts and principles of geotechnical engineering and soil mechanics, including the use of tools and techniques in civil engineering design. It also provides students with an understanding of the role of geotechnical engineering and soil mechanics in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8206

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor Y C Chan)

GEOS8304 Advanced structural mechanics and behaviour (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced structural mechanics and behaviour. The course covers the basic concepts and principles of advanced structural mechanics and behaviour, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced structural mechanics and behaviour in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8207

Course coordinator and teacher: Dr F L Tsang

GEOS8305 Advanced geological and geotechnical engineering (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced geological and geotechnical engineering. The course covers the basic concepts and principles of advanced geological and geotechnical engineering, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced geological and geotechnical engineering in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8205

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8306 Advanced structural mechanics and behaviour (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced structural mechanics and behaviour. The course covers the basic concepts and principles of advanced structural mechanics and behaviour, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced structural mechanics and behaviour in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8207

Course coordinator and teacher: Dr F L Tsang

GEOS8307 Advanced geological and geotechnical engineering (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced geological and geotechnical engineering. The course covers the basic concepts and principles of advanced geological and geotechnical engineering, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced geological and geotechnical engineering in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8205

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8308 Advanced structural mechanics and behaviour (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced structural mechanics and behaviour. The course covers the basic concepts and principles of advanced structural mechanics and behaviour, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced structural mechanics and behaviour in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8207

Course coordinator and teacher: Dr F L Tsang

GEOS8309 Advanced geological and geotechnical engineering (6 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced geological and geotechnical engineering. The course covers the basic concepts and principles of advanced geological and geotechnical engineering, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced geological and geotechnical engineering in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8205

Course coordinator: Dr Louis N Y Wong (taught by Dr Wong and Professor A W Malone)

GEOS8310 Advanced structural mechanics and behaviour (3 credits)

This course aims to provide students with a comprehensive understanding of the principles and techniques of advanced structural mechanics and behaviour. The course covers the basic concepts and principles of advanced structural mechanics and behaviour, including the use of advanced tools and techniques in civil engineering design. It also provides students with an understanding of the role of advanced structural mechanics and behaviour in the design of civil engineering projects.

Assessment: Course work (30%) and written examination (70%)

Pre-requisite: GEOS8207