## Postgraduate Programs

The postgraduate programs in civil engineering aim at training students to solve problems in civil engineering by enlarging and deepening their knowledge base as well as encouraging the intellectual pursuit of creative ideas to improve human and natural environments.

The in-progress and planned projects in Hong Kong for railway construction, port facility expansion, improved road systems, pollution control, and urban re-development demand the work of large teams of civil engineers. As the practice of civil engineering itself develops rapidly, the leaders of these teams are likely to be those who have broad-based and in-depth knowledge of the discipline as well as a good grasp of new design concepts and technologies. Postgraduate training develops such potentials and offers excellent opportunities for students who wish to become future leaders in this profession. Students engaging in postgraduate studies in civil engineering may concentrate on structural, environmental, geotechnical, water resources, transportation, construction engineering or infrastructure development.

The postgraduate programs lead to the degrees of Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) in Civil Engineering. The master's degree programs focus on strengthening students' knowledge in certain areas of civil engineering and exposing them to the issues involved in the conception, design, construction, maintenance, and use of structures and facilities. The PhD program aims at developing the skills needed to identify issues related to civil engineering and the ability to formulate and propose solutions to a problem in an independent manner. In addition to the above programs, the Department also offers self-financing Graduate Diploma and Master of Science (MSc) programs in Environmental Engineering, and participates in the MSc program in Biotechnology.

Applicants for admission to the postgraduate programs are required to have completed, by the time they enroll in HKUST, a bachelor's degree or equivalent in civil engineering or a related engineering field. Students must demonstrate a sound training in physical sciences and mathematics and a good knowledge of basic engineering skills, including the use of computers. Deficiencies must be made up concurrently with postgraduate work if students are otherwise deemed admissible to a postgraduate program on account of their overall preparation.

In addition to satisfying the University requirements for postgraduate degrees, all students admitted to postgraduate studies in the Department of Civil Engineering must complete departmental program requirements as summarized below. Details of departmental program requirements are obtainable from the Department at the time of registration.

## Graduate Diploma and Master of Science (MSc) Programs in Civil Infrastructural Engineering and Management

**Program Director:**

Limin ZHANG, BSc, MSc, PhD *Sichuan*
(Associate Professor of Civil Engineering)

### *Program Objectives*

The programs offer advanced civil engineering and management courses beyond the undergraduate level for both part-time and full-time students. The courses are designed for those who wish to strengthen their civil engineering knowledge and prepare themselves for advanced engineering practices with management responsibilities. The target students are practicing engineers in Hong Kong engaged in the design and management of civil infrastructure systems.

The programs are designed with flexibility to adapt to students' specific needs and interests, while at the same time ensuring sufficient breadth. Few restrictions are imposed on students' course selections. Students have the freedom to define their own areas of concentrations by taking courses from a few selected technical areas, or cover a broad base by taking courses from various areas. This flexibility is valuable as students may have different needs at different stages of their careers.

### *Nominal Program Duration*

2 to 2.5 years (4 to 5 semesters) for part-time MSc degree
1 to 1.5 years (2 to 3 semesters) for full-time MSc degree
1 to 1.5 years (2 to 3 semesters) for part-time Graduate Diploma

### *Program Fees*

The nominal program fees for the Graduate Diploma and the MSc Program are HK$37,500 and HK$75,000, respectively. There is no reduction in tuition fees for students who transfer credits into the program.

The nominal program fee only covers 3 semesters of study, which is the normative duration for the part-time Graduate Diploma and full-time MSc degree programs, and similarly 5 semesters for the part-time MSc program. Students shall pay an additional HK$2,800 per credit if they stay in the program beyond the normative study period covered by the nominal program fee or take additional courses not covered by the

nominal program fee which covers 10 and 5 courses (including transfer credits) for the MSc and Graduate Diploma programs respectively. Students should refer to the web page for details.

***Admission Requirements***

To qualify for admission to these programs, applicants must hold a bachelor's degree in civil engineering or a related engineering field with second-class honors or higher, or an equivalent qualification from a university or tertiary institution. Applicants with degrees in non-civil engineering areas may be required to complete remedial civil engineering courses prior to starting their studies.

***Program Requirements***

Students are required to take a minimum of 30 approved credits to be awarded the MSc degree. A minimum of 15 approved credits is required for the award of the Graduate Diploma. Students shall take courses offered by the programs and each course normally carries 3 credits.

The courses offered are arranged in eight sub-areas:

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|---|---|---|
| 1. | Infrastructural System Engineering and Management | CIEM 510, CIEM 512, CIEM 513, CIEM 515, CIEM 516, CIEM 517, CIEM 518, CIEM 581 |
| 2. | Material Engineering | CIEM 521, CIEM 524, CIEM 525, CIEM 533 |
| 3. | Structural Engineering | CIEM 531, CIEM 532, CIEM 534, CIEM 535, CIEM 537 |
| 4. | Environmental Engineering | CIEM 541, CIEM 542, CIEM 547, CIEM 548 |
| 5. | Water Resources Engineering | CIEM 557 |
| 6. | Transportation Engineering | CIEM 562, CIEM 563 |
| 7. | Geotechnical Engineering | CIEM 572, CIEM 574, CIEM 577, CIEM 578 |
| 8. | Fire Engineering | CIEM 591, CIEM 592, CIEM 593, CIEM 594 |

Subject to the approval of the Program Director, students may take optional special topics and project courses CIEM 600 and CIEM 698 which cover one of the above sub-areas.

To ensure breadth of the curriculum, students enrolled in the Graduate Diploma program must take courses from at least 2 sub-areas, whereas students enrolled in the MSc program must take courses from at least 3 sub-areas. Students are recommended to select Infrastructural System Engineering and Management as one of the sub-areas. Subject to the approval of the Program Director, students may take a maximum of six credits of CIVL or JEVE courses from the programs offered by the Department of Civil Engineering, or IBTM courses from the MSc program in Intelligent Building Technology and Management offered by the Department of Mechanical Engineering as partial fulfillment of the graduation requirements of the Graduate Diploma program or the MSc program. Subject to the approval of the Program Director and Course Instructor, Graduate Diploma students may take a maximum of three credits of CIVL courses at 300-level and MSc students may take a maximum of six credits of CIVL courses at 300-level as partial fulfillment of the program requirements.

For course offerings in 2006-2007, students should refer to the web page.

Credit transfer may be granted to students in recognition of studies completed successfully elsewhere. Credits previously used to satisfy the requirements of other academic qualifications may not be transferred. Application for credit transfer must be submitted to the Program Office during the student's first month at the University. Upon the approval of the Program Director, a maximum of 9 transfer credits may be granted for the MSc program whereas a maximum of 6 transfer credits may be allowed for the Graduate Diploma program. For regulations governing credit transfer for postgraduate programs, please refer to Section 31 of the Postgraduate Regulations in this Calendar.

***Program Transfer***

Students of the MSc Program may subsequently apply to transfer to the Graduate Diploma Program subject to the approval of the Program Director, and vice versa. Students should refer to the web page for details.

***Graduation Requirement***

To graduate from either program, a student must complete the program with a graduation grade average (GGA) of B or above as required for all postgraduate studies at the University. Students failing to meet the graduation grade average requirement are required to repeat or take additional course(s) even if they attain passing grades for all courses.

## Master of Science (MSc) Program in Biotechnology

This multidisciplinary program is jointly offered by the Departments of Biochemistry, Biology, Chemistry, Chemical Engineering, and Civil Engineering. For details, please click here.

## Master of Philosophy (MPhil) Program in Civil Engineering

To be considered for admission, applicants must have completed a bachelor's degree in Civil Engineering with at least second class honors from a recognized university, or an equivalent qualification from another tertiary institution. In exceptional cases, applicants submitting evidence of other academic and professional qualifications may be considered.

The MPhil program requires completion of at least 15 credits of approved course work, and all full-time MPhil students are required to attend departmental seminars. Full-time MPhil students are required to take and pass CIVL 680 Civil Engineering Seminar I [1-0-0:0] at least twice and CIVL 681 Civil Engineering Seminar II [1-0-0:0] at least once. The candidate will normally conduct thesis research on campus although the advisor may permit the candidate to spend a period of time in the field, within another institution or elsewhere away from the University. Full-time MPhil students are required to take and pass LANG 501 Group Communication Skills Development [0-3-0:1]. The one credit earned from LANG 501 cannot be counted toward the degree requirements. Students can be exempted from taking LANG 501 by the Department Head or the PG Coordinator, based on the students' background and/or the English proficiency assessment of the Language Center.

In addition to the program requirements specified above, students who opt for the Nanotechnology concentration are required to

- take one NANO course or CIVL 516;
- complete NANO 601 for one semester; and
- conduct research in nano area.

On completion of the program of study and research, the student shall submit a thesis demonstrating competence in engineering research. The work described must have been substantially completed subsequent to enrollment for the degree. The thesis should reach a satisfactory standard of expression and presentation, and consist of an account of the student's own research. The student may not submit as the main content of the thesis any work or material which has previously been submitted for a university degree or some other similar awards.

## Doctor of Philosophy (PhD) Program in Civil Engineering

To be considered for admission, applicants must have obtained either a master's degree (or equivalent) in civil engineering (or in a related field), or a bachelor's degree in civil engineering with first class honors, or equivalent qualification, from a recognized university or tertiary institution. In exceptional cases, applicants submitting evidence of other academic and professional qualifications may be considered.

The PhD program requires completion of at least 30 credits of approved course work. Students with a master's degree may be granted credit transfer of up to 15 credits. In general, PhD students are expected to maintain a B+ average in their course work. In addition, all full-time PhD students are required to attend departmental seminars. Full-time PhD students are required to take and pass CIVL 680 Civil Engineering Seminar I [1-0-0:0] at least four times. All PhD students, regardless of study mode, are required to take and pass CIVL 681 Civil Engineering Seminar II [1-0-0:0] at least twice. Full-time PhD students are required to take and pass LANG 501 Group Communication Skills Development [0-3-0:1]. The one credit earned from LANG 501 cannot be counted toward the degree requirements. Students can be exempted from taking LANG 501 by the Department Head or the PG Coordinator, based on the students' background and/or the English proficiency assessment of the Language Center.

In addition to the program requirements specified above, students who opt for the Nanotechnology concentration are required to

- take one NANO course or CIVL 516;
- complete NANO 601 for one semester; and
- conduct research in nano area.

To become a doctoral candidate, a student must pass a qualifying examination. Full-time PhD students must pass the qualifying examination within 18 months of initial registration while part-time PhD students must pass the qualifying examination within 36 months of initial registration. A maximum postponement of 3 months may be allowed subject to prior approval from the departmental postgraduate committee. The qualifying examination consists of both written and oral examinations. The written examination, which covers undergraduate and first-year postgraduate civil engineering materials, evaluates the student's comprehension of scientific and engineering principles and engineering synthesis, and the student's preparation for postgraduate study. Prior to undertaking the examinations, each PhD student will have prepared a written thesis research proposal, and will orally present and defend it. In addition, the student will

answer questions of a general civil engineering nature and questions relevant to the proposed research.

Following the above, the qualifying examination committee will recommend that (1) the student has passed the qualifying examination and is a candidate for the degree; or (2) the student should undertake further study to rectify deficiencies uncovered in the examination but may continue with the research component without another written or oral examination, and upon successful completion of these further studies, the student will automatically become a candidate for the degree; or (3) the student should undertake further studies and must repeat the written and/or oral component within 6 months; or (4) the student has failed and must withdraw from the PhD program. Students who fail the qualifying examination for the second time will be required to withdraw from the PhD program or, with the special approval of the departmental postgraduate committee, be allowed to transfer to the MPhil program.

The candidate will normally conduct the thesis research on campus, although the advisor may permit the candidate to spend a period of time in the field, within another institution or elsewhere away from the University.

On completion of the program of study and research, the student shall submit a thesis demonstrating competence in engineering research. The work described must have been substantially completed subsequent to enrollment for the degree. The thesis should reach a satisfactory standard of expression and presentation, and consist of an account of the student's own research. The student may not submit as the main content of the thesis any work or material which has previously been submitted for a university degree or some other similar awards.