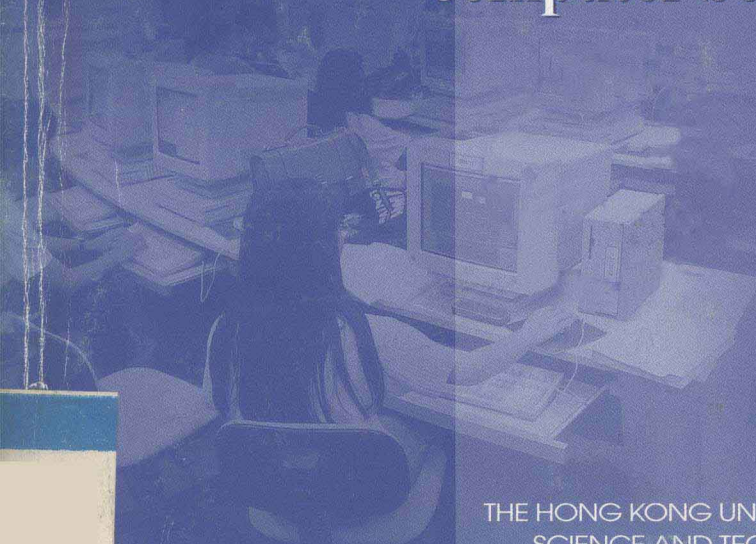*Postgraduate Studies*

1997-98

DEPARTMENT OF

Computer Science

THE HONG KONG UNIVERSITY OF
SCIENCE AND TECHNOLOGY
香港科技大學

CONTENTS

Introduction

Computer Science is the discipline that studies the structure, function, and utilization of computers. The Computer Science programmes at the Hong Kong University of Science and Technology cover a wide range of topics which include networking, parallel computing, computer architecture, data base systems, information management and retrieval, machine vision, machine translation of natural languages, neurocomputing, computer graphics, software engineering, theory of computation, and analysis of algorithms.

Traditional computer science research covers the hardware and software of computer systems and their applications. Computer Science programmes at HKUST emphasize an integrated approach to the study of computers and computing methods to collect, process, analyze and transmit information to support relevant and useful applications found in today's society. Our postgraduate students are involved in research projects ranging from applied research, such as the development of an information system which integrates maps, roads, buildings, water pipes, gas lines, and other similar information of Hong Kong for effective resource management and city planning, to fundamental research, such as the study of optimal approaches to allocate computationally intensive tasks onto a large number of connected computer processors for fast parallel execution.

Our goal is to offer a full range of postgraduate courses and research projects to meet the needs and interests of our students and for solving relevant problems for society. We offer programmes that lead to the MSc, MPhil and PhD degrees.

Academic Staff

Professor and Head of Department

Roland T. CHIN (PhD, Missouri-Columbia) *

Professor and Associate Head of Department

Samuel T. CHANSON (PhD, UC Berkeley) *

Professors

~~Chin-Hui LEE (PhD, Univ. of Washington)~~

Frederick H. LOCHOVSKY (PhD, Toronto) *

Vincent Y. SHEN (PhD, Princeton) *

Derick WOOD (PhD, Leeds) *

Readers

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Dik L. LEE (PhD, Toronto)

Ting-Chuen PONG (PhD, Virginia Tech. Inst. and State Univ.)

Associate Professors

Amelia FONG LOCHOVSKY (PhD, Princeton) *

Helen C. SHEN (PhD, Waterloo) *

Assistant Professors/Lecturer

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Sunil ARYA (PhD, Maryland, College Park)

George BACIU (PhD, Waterloo)

Lewis H. M. CHAU (PhD, UCLA)

Siu-Wing CHENG (PhD, Minnesota)

Shing-Chi CHEUNG (PhD, Imperial College, London) *

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Alex C. Y. KEAN (PhD, British Columbia)

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Qing LI (PhD, Southern California)

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Nevin Lianwen ZHANG (PhD, Beijing Normal; PhD, British Columbia)

Adjunct Professor

Herbert EDELSBRUNNER (PhD, Austria)

Adjunct Assistant Professor

Babak HAMIDZADEH (PhD, Minnesota)

* Fellow/Member of HKIE

Postgraduate Programmes

The postgraduate programmes of the Department of Computer Science aim at equipping students with the skills and knowledge needed to meet the challenge of satisfying Hong Kong's present and future development needs related to computer software and systems. The Department offers the degrees of Master of Science (MSc), Master of Philosophy (MPhil) and Doctor of Philosophy (PhD) in Computer Science. The MSc degree is a taught (coursework only) degree while the MPhil and PhD degrees are research degrees with some coursework component.

The MSc and MPhil programmes focus on strengthening students' knowledge in certain areas of computer science and on exposing them to the issues involved in the development of scientific, educational, and commercial applications of computer systems. Holders of these degrees are qualified to be technical leaders in industrial research or development organisations. This level of advanced education is already in great demand in most industrial societies, as many multinational companies require their technical employees to hold a master's degree. Some companies in North America even send their new-hires back to school immediately at the company's expense in order to earn such a degree before they begin their careers.

The PhD programme aims at developing skills needed to identify research issues related to a practical application, to formulate an original research plan that addresses some of the research issues identified, and to independently create an effective computing-related solution for the problem. This degree is normally required for people planning to pursue a career in academia. It is also an excellent qualification for positions in research organisations in industry. Successful careers in these organisations often lead to high-level management positions in high-tech companies.

In addition to the traditional areas of research in computer science, students are encouraged to choose applications from other research areas in science, engineering, business, social science, and the humanities. A student can receive some of the credits required for a postgraduate degree in Computer Science by taking approved postgraduate courses in other departments at HKUST or at other tertiary institutions in Hong Kong.

Postgraduate Degree Requirements

In addition to satisfying the University requirements for postgraduate degrees as described in the Academic Calendar, all students admitted to postgraduate studies in the Department of Computer Science must complete Departmental programme requirements as detailed below.

Course Requirements

Each student is required to take a minimum number of credits and/or courses as determined by the degree programme in which he/she is enrolled. The credits and courses (in brackets) currently required for each programme are indicated in the table below:

Degree	Course Credits	Project Credits	Seminar Credits	Total Credits
MSc				
Coursework-and-Project Option	24(8)	4(1)	2(2)	30
Coursework-Only Option	27(9)	-	3(3)	30
MPhil	15(5)	-	2(2)	17
PhD	15(5)	-	2(2)	17^1

Note 1. May be waived or reduced on completion of a relevant Master's degree.

General Course Requirements for all Postgraduate Programmes

1. Breadth requirement
   Credits used to satisfy the course requirements must cover the following areas:
   i.   Foundations of Computer Science
   ii. three (3) of the following:
        - Applications of Computer Science
        - Artificial Intelligence
        - Computer Engineering
        - Data and Knowledge Management
        - Software Technology

2. Advanced Seminar courses
   Credits earned from Advanced Seminar (COMP 695) courses cannot be counted towards degree requirements.

3. Independent Studies course
   Only one independent studies course may be used to satisfy the course requirements for any postgraduate programme.

4. Graduation average requirement

The graduation grade average (GGA) obtained in the courses used to satisfy the degree requirements must be at least B.

Special note: At the time of production of this prospectus, the Department is considering the introduction of a Business Communication requirement for all postgraduate students. If approved, this requirement would become effective with the 1997-98 academic year and would add three more credits to the MPhil and PhD programmes which would then require a total of 20 credits each.

Requirements for the MSc Degree in Computer Science

Normal duration for programme completion	1.5 years
Maximum duration for programme completion	5 years
Total course credits required	30 credits
Credits required in computer science courses	20 credits
Maximum external transfer credits allowed	10 credits[1]

Note 1. Seminar course credits cannot be transferred.

Coursework-and-Project Option

A student must complete at least eight (8) postgraduate courses (total of 24 credits), COMP 698 MSc Research Project course (4 credits), and the Computer Science seminar course for two semesters (total of 2 credits). The final project report must be read and graded by two faculty members, one of whom is the student's academic advisor.

Coursework-Only Option

A student must complete at least nine (9) postgraduate courses (total of 27 credits) and the Computer Science seminar course for three semesters (total of 3 credits).

Requirements for the MPhil Degree in Computer Science

Normal duration for programme completion	2 years
Maximum duration for programme completion	5 years
Total course credits required	17 credits
Maximum external transfer credits allowed	9 credits[1]

Note 1. Seminar course credits cannot be transferred.

Coursework Requirement

A student must complete at least five (5) postgraduate courses (total of 15 credits) and the Computer Science seminar course for two semesters (total of 2 credits).

Thesis and Thesis Defence Requirement

Each MPhil student is required to conduct research, to submit a thesis and to defend it before an MPhil thesis examination committee at a public oral defence.

An MPhil thesis examination committee, approved by the Head of the Department, should be set up at least six (6) weeks before the proposed date of the MPhil thesis oral defence. The committee shall consist of three (3) faculty members (including the supervisor). A majority of the members shall be from the Computer Science Department. The thesis should be distributed to the committee members at least four (4) weeks prior to the oral defence. Two copies should also be given to the director of Postgraduate Studies.

Conduct of MPhil Thesis Examination

The Director of Postgraduate Studies shall appoint a Chair of the MPhil thesis examination committee who is a faculty member in the Department but *is not* a voting member of the thesis examination committee. The Chair:

(a) obtains the thesis examination report form and the candidate's file from the Departmental office and takes them to the thesis examination;
(b) ensures that the thesis examination is conducted according to University and Departmental rules and guidelines;
(c) confirms that examination committee members have adequate knowledge of the thesis in order to judge it, and that they will not abstain from voting on the thesis on the basis that they have insufficient knowledge of the thesis;
(d) reminds the examination committee members that the thesis examination consists of both the written thesis and the oral defence;
(e) ensures that the thesis examination report is completed; and
(f) informs the candidate orally of the examination committee's decision immediately after the examination.

The thesis examination takes place in a single session and comprises four parts, the first two of which are open to all members of the University and to Departmental guests. The third part is closed to all but the Chair, the committee and the candidate, and the fourth part is a closed session of the Chair and the examination committee in the absence of the candidate.

Part 1: Public oral presentation by the candidate

At the invitation of the Chair, the candidate will give a 30-45 minute presentation outlining the thesis research and its contribution. During the presentation, no public questions will be allowed.

Part 2: Public question and answer period

During this part of the examination, all questions are addressed through the Chair and any dialogue limited to the candidate and the individual questioner. The questioning shall proceed as follows:

(a) The thesis examination committee shall question the candidate in a round-robin fashion and in an order determined by the Chair except that the candidate's thesis supervisor(s) shall normally be last in the order. Each member of the thesis examination committee shall question the candidate until they are satisfied that they have enough information in order to make a decision.
There shall be no time limit for this phase of the questioning.
(b) Anyone else in attendance may question the candidate.
Depending on the circumstances and at the discretion of the Chair, a time limit may be imposed on this phase of the questioning.

Part 3: Closed discussion with the candidate

During this part of the examination, only the Chair, the thesis examination committee and the candidate are present. The examination committee may, as necessary, further clarify aspects of the thesis research and the oral presentation. At the end of the discussion, the candidate must leave the examination venue.

Part 4: Closed session of the thesis examination committee

During this part of the examination, only the Chair and the thesis examination committee are present. The examination committee assesses the thesis and the performance of the candidate. A motion, according to one of the possible outcomes of the thesis examination, is made by a member of the examination committee and a secret ballot (yes/no vote) on the motion, supervised by the Chair, is taken. A simple majority vote shall carry the motion. The Chair informs the examination committee of the outcome of the ballot and, together with members of the thesis examination committee, completes the report on the thesis examination.

Requirements for the PhD Degree in Computer Science

Normal duration for programme completion (after a baccalaureate degree)	4 years[1]
Maximum duration for programme completion (after a baccalaureate degree)	8 years[1]
Total course credits required	2-17 credits[2]
Maximum external transfer credits allowed	15[3]

Note 1.   These times are reduced by one and a half years if a relevant Masters degree is earned prior to entering the PhD programme.
Note 2.   May be waived or reduced on completion of a relevant Master's degree.
Note 3.   Seminar course credits cannot be transferred.

Coursework Requirement

A student without a relevant Master's degree must normally complete at least five (5) postgraduate courses (total of 15 credits) and the Computer Science seminar course for two semesters (total of 2 credits). The postgraduate course requirement may be waived or reduced, upon approval of the Postgraduate Studies Committee, if the student has earned a relevant Master's degree.

GRE Requirement

Each PhD student must submit the results of the computer science subject Graduate Record Examination (GRE). The exam must have been taken within five years of the time of application. The minimum acceptable score for the computer science subject GRE is normally the 80th percentile. It is desirable for the GRE exam results to be submitted along with the application for admission into the PhD programme. However, if the results are not available at the time of application they can be submitted after admission into the programme. The GRE results must be submitted before attempting the qualifying requirement.

Qualifying Requirement

Each PhD student must satisfy the PhD qualifying requirement which consists of a comprehensive, written critical survey and review of the student's intended research focus and a public oral examination. The purpose of the qualifying requirement is to assess the student's understanding of the literature, as well as preparedness to do research, in the selected research focus. The written survey and review should identify important research issues in the student's intended research focus. The research focus should be broad enough to contain many potential thesis topics, yet sufficiently narrow that the highly relevant papers number in the tens rather than in the hundreds. The student is required to present and be examined on the survey and review before his/her qualifying examination committee at a public oral examination.

A qualifying examination committee, approved by the Head of the Department, consisting of a minimum of four (4) faculty members (including the supervisor) should be set up at least six (6) weeks before the date of the qualifying oral examination. A majority of the qualifying examination committee members shall be from the Computer Science Department. The Director of Postgraduate Studies shall appoint the Chair of the examination committee. The written survey and review should be distributed to the committee members at least two (2) weeks prior to the oral examination. One copy should also be given to the director of Postgraduate Studies.

A PhD student is expected to fulfil the PhD qualifying requirement by the end of his/her first year of study. The PhD qualifying requirement can be attempted at most twice. The second attempt must be completed within six months of the first attempt. When a student passes the PhD qualifying requirement, he/she becomes a PhD candidate.

Thesis Proposal Requirement

Each PhD candidate is required to submit a thesis proposal and to defend the proposal at a public oral examination, normally within one year after satisfying the qualifying requirement.

A thesis proposal examination committee, approved by the Head of the Department, consisting of a minimum of four (4) faculty members (including the supervisor) should be set up at least six (6) weeks before the date of the thesis proposal defense. A majority of the thesis proposal examination committee members shall be from the Computer Science Department. The Director of Postgraduate Studies shall appoint the Chair of the examination committee. The thesis proposal should be distributed to the committee members at least two (2) weeks prior to the oral examination. One copy should also be given to the director of Postgraduate Studies.

Thesis and Final Thesis Defence Requirement

Each PhD candidate must submit a thesis describing significant original research completed at HKUST. A public oral examination by a thesis examination committee must be held in defence of the thesis research.

A thesis examination committee approved by the Head of the Department, should be set up no later than nine (9) weeks before the date of the examination. This committee shall consist of five (5) members: the thesis supervisor, two academic staff members from the Department, one academic staff member from outside the department, and one member external to the University who has expertise in the field being examined. The thesis should be distributed to the committee members at least four (4) weeks prior to the oral examination. One copy should also be given to the director of Postgraduate Studies.

Conduct of PhD Thesis Examination

The PhD thesis examination shall be conducted in accordance with the regulations for conduct of thesis examinations as found in the Academic Calendar.

Procedural and Administrative Matters

Reporting for duty

All students are normally required to report to the Department at least one week before the start of each semester. Failure to do so may mean that the Department is unable to offer financial assistance to the student for that semester.

Interim and Permanent Academic Advisors

Each entering student is assigned an academic advisor. In some cases the assignment is on an interim basis. All entering students are urged to meet with their academic advisor as early as possible to discuss course selection and to determine whether the assignment is mutually compatible.

An interim assignment is for the purpose of allowing entering students to have a regular contact point with the faculty while they become familiar with the Department and its faculty. If the interim academic advisor is not compatible with a student's research interests, it is the student's responsibility to seek an alternate academic advisor with whom they feel they can profitably work. *Interim academic advisor assignments must be changed to permanent assignments before the start of the student's second semester.* To change the academic advisor, students should obtain and complete the form *Request to Assign/Change Academic Advisor* available from the Computer Science office.

Programme Performance and Progress

All postgraduate students are required to maintain satisfactory performance in both their courses and their teaching/research responsibilities. For courses, students are required to maintain a CGA of at least B. For research, students are required to complete their degree requirements within the time-limit specified for each requirement and to show reasonable progress towards degree completion at the end of each semester.

To monitor progress, all MPhil and PhD students are required to complete and submit progress reports at the end of each semester. The progress reports are completed in conjunction with the student's academic advisor(s). Unsatisfactory progress may lead to loss of a student's financial support and/or required withdrawal from their study programme.