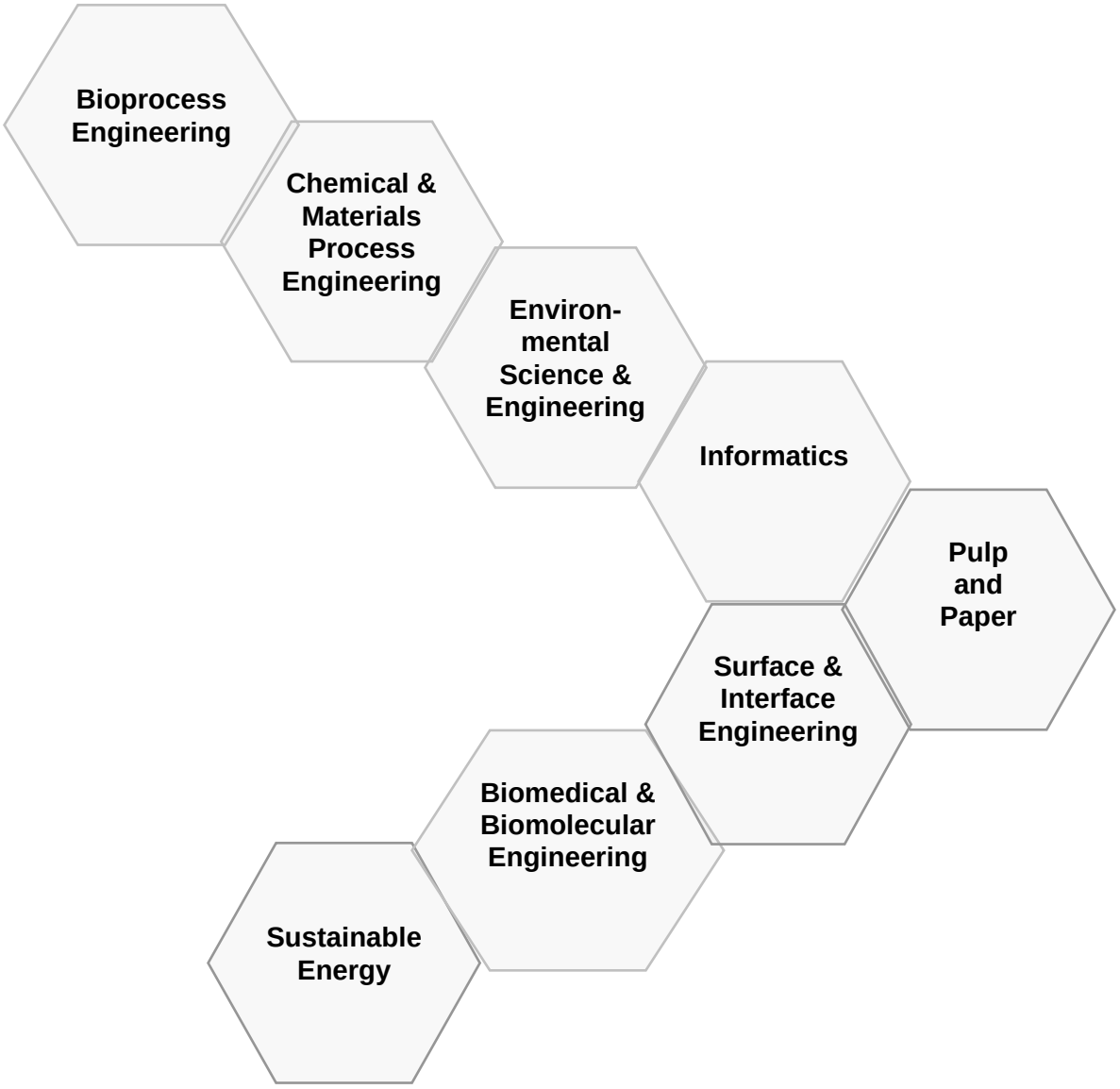
GRADUATE STUDENT HANDBOOK

2007-2008



Welcome to the Department of Chemical Engineering and Applied Chemistry. We hope that your stay here will be a happy and rewarding experience.

Every year about 35 new graduate students enter the Department to begin advanced studies. There are many questions that will come to mind as you familiarise yourself with the routines of the School of Graduate Studies and the Chemical Engineering Department. This handbook will introduce to you various members of the Department who can answer some of these questions either directly or by referral, and also list the services available for your convenience. As well it will make you aware of the role you have to play as a graduate student within the Department. Should you require any additional information, please consult your supervisor or the Coordinator of Graduate Studies.

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Graduate Students' Quick Check- list:

What	Who	Where
Desk space	Ask your supervisor	
Building Keys/Photocopy Cards	Leticia Gutierrez/Gorette Silva	WB 217*
Payments/TA Assignments/Library Card	Julie Mendonça	WB 201C
Safety Training	Leticia Gutierrez	WB 217
Shipping & Receiving/Purchasing	Terry Bunting	WB 16
Activate Library Card for access to the Graduate Common Room	Dan Tomchyshyn	WB 260/WB 261
Expense Reimbursement/Financial Information	Arlene Fillatre	WB 217
Chair	Professor D.W. Reeve	WB 220
Associate Chair and Coordinator of Graduate Studies	Professor V.G. Papangelakis	WB 213
Graduate Administrator Graduate Assistant	Pauline Martini Joan Chen	WB 212 WB 212
Associate Chair and Coordinator of Undergraduate Studies	Dr. G. Norval	WB 216C
Undergraduate Administrator Undergraduate Office Assistant	Luisa Gomes Jennifer Veitch	WB 216B WB 216A

* WB – Wallberg Building, 200 College Street

Locations of Offices and Services:

		Office No.
Chair of the Department	Professor D.W. Reeve	WB 221
Executive Assistant to the Chair	Ms. J. Rogers	WB 221
Associate Chair and Coordinator of Graduate Studies	Professor V.G. Papangelakis	WB 213
Graduate Administrator	Ms. P. Martini	WB 212
Graduate Assistant	Ms. J. Chen	WB212
Associate Chair and Coordinator of Undergraduate Studies	Dr. G. Norval	WB 216A
Undergraduate Administrator	Mrs. L.Gomez	WB 216B
Undergraduate Office Assistant	Ms. J. Veitch	WB 216A
Coordinators of Occupational Health and Safety	Professor B.A. Saville Ms. K. Weishar	WB 362 WB 201B
General Office		WB 217
Business Officer	Ms. A. Fillatre	WB 217
Payroll	Mrs. J. Mendonça	WB 201C

Petty Cash, Expense Reimbursement, Purchase Orders, Research Accounts	Ms. A. Fillatre	WB 217
Photocopy Services		WB 16
Purchasing, Equipment, Supplies, Services, Orders	Mr. T. Bunting	WB 16
Computer/Network Services	Mr. D. Tomchyshyn	WB 260
	Mr. J. Wong	WB 260
First Aid*	Professor B.A. Saville	WB 362
	Ms. K. Weishar	WB 201B
Environmental Recycling Officer	Mrs. J. Mendonça	WB 201C
Graduate Student Teaching Assignments	Mrs. J. Mendonça	WB 201C
Student Theses	Mrs. L. Gutierrez	WB 217
Engineering Library	Sandford Fleming Building, King's College Road	
Co-Chairs, Graduate Students' Association	Mr. V. Castellino	WB 361
	Ms. A. Tran	WB 259
Graduate Lounge - coffee, cold drinks, telephone, mail boxes		WB 247
Undergraduate Lounge – vending machines		WB 238
Dry Ice		WB 25
Liquid Nitrogen		WB 25
Cobalt Radiation Cell		WB 120
Xray	Professor D. Perovic	WB 140D
Environmental Engineering and Energy Systems	Professor B.W. Karney 35 St. George Street	GB 134

<u>Extra Services</u>:

Career Counselling and Career Centre	Koffler Centre, 214 College Street
International Student Centre	33 St. George Street
School of Continuing Studies	158 St. George Street
School of Graduate Studies	63/65 St. George Street
University Housing Service	Koffler Centre, 214 College Street

*First Aid stations are located in all undergraduate laboratories (WB3, 102, 125, 203, 303), in Room WB 218, and in the Pulp and Paper Centre, WB 420.

1. RESPONSIBILITIES OF RESEARCH PROGRAM STUDENTS AND SUPERVISORS

By entering into a research oriented graduate program, you have made a commitment to devote the time and energy necessary to engage in research and write a thesis that makes a substantial and original contribution to knowledge. **It is the student's responsibility to conform to university and program requirements and procedures**. It is the duty of the supervisor to be reasonably available for consultation, although the primary responsibility for keeping in touch rests with the student. Other principles which will help to smooth the pathways as you proceed with your degree program are listed below.

- Obtain a clear indication that the research topic you are pursuing and the methodology you are using are likely to yield original contributions to knowledge (that is, are likely to result in an acceptable thesis).

- Review the literature regularly and keep your literature survey up-to-date.

- Maintain exemplary records of your experimental/theoretical work. It is essential that your records be clear and complete, so that others could replicate your experiments recognizing that others may not interpret their results in the same way as you have.

- Develop a clear understanding with your supervisor concerning ownership of intellectual property (see also the SGS Calendar, INTELLECTUAL PROPERTY, in the General Regulations section) and the possibilities of co-authorship of papers and patent applications.

- Consult the Department brochure and understand all of the elements that are required for completing the degree program. Establish a timetable for yourself, estimating realistically the time required for experimentation and thesis writing.

- Apply for a TA position if you want to receive the guaranteed TA funding.

- If you are uncertain about your writing skills, make a serious effort to remedy this problem throughout your program rather than waiting until you are faced with writing the final document.

- Make yourself available to your supervisor at mutually acceptable times for regular meetings.

- The supervisor should provide opportunities for students to meet leading scholars in the field (for example, by introducing students to seminar speakers) and should encourage students to make public presentation of various aspects of their research.

- The supervisor will make provisions to ensure adequate supervision during research leaves of the supervisor, or other extended absences of student **or** supervisor from the university.

- **If you are a Ph.D. student**: organize, with your supervisor's help, a supervisory/reading committee (see section 2.3, item 4) made up of at least three members of the graduate faculty (including your supervisor). This should be done at the beginning of your program. Arrange committee meetings **every nine months** at which you present a report of your progress and an outline of future research directions.

2. DEPARTMENTAL POLICIES ON GRADUATE PROGRAMS

2.1.1 M.A.Sc. Program

Candidates are admitted under the general regulations of the School of Graduate Studies (SGS) outlined in the SGS Calendar. Although the minimum standard of SGS for admission is a mid-B standing or equivalent in the final year undergraduate level, this does not guarantee admission. The Admissions Committee considers the entire undergraduate record of applicants in deciding admissibility, but a B+ average (or equivalent) in each of the last 2 years of study is required.

1. The program for the M.A.Sc. degree involves three elements, of which the first is the most important:

   (i) research leading to a thesis which is defended at an oral examination;

   (ii) M.A.Sc. Course Selection Guidelines:

   Please keep these course requirements in mind when selecting your courses and completing the course registration form. **All courses require prior approval by the Coordinator of Graduate Studies and research supervisor.**

   1) 3 one-term courses. Of these courses:
      a. 1 must be chosen from Category A
      b. 1 course from an area outside the candidate's research area
   2) Courses are normally taken from engineering or physical science departments.
   3) 2 courses should be completed in the first term of the program. All required courses will normally be completed during a candidate's first year of study.
   4) In the first year of study, students must also attend the “How to be an Outstanding Graduate Student Seminar Series”; please consult the schedule. No enrolment in ROSI is required for this seminar series.

5) Successful completion of CHE 2222H (Safety Training Workshop) before embarking on research or teaching in the undergraduate laboratories. The course is offered in September.

6) Successful completion of the Ethics in Research course, JDE 1000H. This course is normally completed in the first year of study.

7) Successful completion of the seminar course CHE 3000Y in **each** year of study.

8) Completion of CHE 2011H - Graduate Student Seminars - in **each** year of study. Students in the following programs are exempt from CHE2011H:
a. Pulp and Paper field - take CHE 1211H instead
b. Collaborative Environmental Engineering Program (CEEP) - take EDE3000H instead
c. Biomedical Collaborative Program (IBBME) – take BME 1010H or BME 1011H instead

9) Successful completion of the annual WHMIS refresher course **each** subsequent year of registration in the program.

10) Students in a collaborative program must normally satisfy the requirements of that program in addition to this Department's requirements.

(iii) Teaching assistance (not mandatory) in the undergraduate program.

2. It is desirable that the program for each candidate be planned and carried out so that it may be completed within a period of three to four consecutive terms (including the summer term). (The minimum residence period is one academic session consisting of the fall and winter terms; there are three terms in a calendar year.) After four consecutive terms, a student's progress may be reviewed by the Coordinator of Graduate Studies. This procedure is primarily designed to encourage uniform work loads for M.A.Sc. students, but it also has implications for those students wishing to proceed to a Ph.D. degree in this Department (see item 2.1.2 below).

3. With a normal first semester course load of 2 courses a supervisor will assume that their research student has spent 50% of his or her time on research. <u>After each semester, the Departmental Graduate Studies Committee will consider the cases of those students who fail one graduate course and/or who are not performing well in research. Students who at any time accumulate two failing grades will be required to withdraw unless extenuating circumstances exist</u>. Students with one failure who are allowed to proceed will have their cases reviewed at a later date.

4. The thesis should give evidence, in the judgement of the examining committee, of mastery of the topic, originality and creativity, and be written and defended in an acceptable manner. Although it is desirable that the work reported in the thesis be of such a nature and calibre that it can be published, either in its own right or in conjunction with other work, it is not a requirement for fulfilment of the degree program that the research work reported be "publishable". The thesis should be no longer than 100 pages plus relevant appendices. If the student believes the thesis must be

significantly longer, then he or she should consult his or her supervisor and the Coordinator of Graduate Studies. **Students are advised to refer to the pamphlet, Guidelines for the Preparation of Theses for Microfilming and Binding, published by SGS (see Section 2.4) before typing the thesis. Theses which do not conform to these guidelines will NOT be accepted by SGS.**

5. Students whose research work is unsatisfactory in the opinion of their supervisor or who have not completed the degree requirements after 18 months may have their progress to date assessed by a three-person committee made up of the supervisor and two faculty knowledgeable in the research area. The committee has complete authority to recommend the termination of a student's degree program if adequate progress is not demonstrated.

6. A student who wishes to proceed to a Ph.D. program upon completion of the M.A.Sc. should refer to Section 6.1, subsection 4.

7. The candidate should remain in continuous residence until the Departmental oral examination is completed.

2.1.2 M.A.Sc. Bypass

1. After 8 months in the program, very strong M.A.Sc. candidates may apply to bypass the M.A.Sc. and transfer directly to the Ph.D.program. A student who wishes to bypass the M.A.Sc. degree and proceed to a Ph.D. program must satisfy the following requirements:

   (i) The student should obtain an average of A- in the three courses taken in the M.A.Sc. program.

   (ii) The student must submit a written (hard copy, 2 weeks in advance) summary (30-40 pages is typical) of completed and proposed research to a committee of at least 4 people (supervisor plus 3 others) one of whom is appointed by the Coordinator of Graduate Studies. At least one of the 2 the other members must normally be from this Department. The student must contact the Coordinator of Graduate Studies before finalizing the committee membership. On the basis of this presentation and defence the committee will decide whether the student can bypass the M.A.Sc. degree. **In this case unanimous agreement is required at the highly recommended level.**

2. The bypass oral should be taken about 12 months into the program. It should normally be completed before 16 months. Times outside of the 12-16 months window require approval of the Coordinator of Graduate Studies.

3. Upon successful completion of the bypass oral, students should fill out a Transfer Request form which is available on the School of Graduate Studies website, www.sgs.utoronto.ca. This is necessary for the official transfer into the Ph.D. program.

2.2 M.Eng. Program

1. The M.Eng. program is primarily intended for engineers in full-time professional practice, who wish to pursue advanced studies at the Master's, without committing themselves to full-time residence for experimental research. The program be taken on either a full-time or a part-time basis. Departmental financial assistance is available to **full-time Canadian citizens and landed immigrant students only in 2007/08**.

2. M.Eng. Course Selection Guidelines

   Please keep these course requirements in mind when selecting your courses and completing the course registration form. **All courses require prior approval by the Coordinator of Graduate Studies.**

   M.Eng. Course Requirements:

   1) 10 one-term courses:
      a. 4 to 8 technical courses
      b. a 3 course project (optional)
      c. 2 to 3 non-technical courses, offered through the Faculty of Applied Science and Engineering (see: http://www.engineering.utoronto.ca/informationfor/graduate/mgmt.htm for details on the courses offered)

   2) M.Eng. students are required to take the Safety Training Workshop (CHE 2222H) **only** if they are completing a project as part of their program. The workshop will need to be completed prior to beginning the project. The course is offered every September.

   3) Students in the Collaborative Environmental Engineering Program (CEEP) must also meet the CEEP requirements – for more information please visit the program website at: http://www.energy.engineering.utoronto.ca/.

   Course selection: Courses are normally taken from engineering or physical sciences departments. However, the following guidelines apply to course selection for M.Eng. students:

   a) As part of their course requirements, M.Eng. students may take a **maximum** of 1 one-term course from the Faculty of Management Studies or a **maximum** of 3 Engineering Management courses offered by the Faculty of Applied Science and Engineering.

   b) No more than 3 “500 level” courses may be used towards the M.Eng. degree.

   c) Students in the Collaborative Environmental Engineering Program (CEEP) may take, as part of their 7- or 10-course requirement, up to 2 one-term courses from the Institute for Environmental Studies in order to fulfil the requirements of the CEEP.

d) Students in the Integrated Manufacturing Program (IMP) may take up to 2 one-term courses from the Faculty of Management Studies to fulfil the requirements for the IMP.

3. Only candidates with an engineering degree are eligible for admission to this program. Although the minimum standard of the School of Graduate Studies for admission is a mid-B standing or equivalent in the final year undergraduate level, this does not guarantee admission. The Admissions Committee considers the entire undergraduate record of applicants in deciding admissibility, but a B+ average (or equivalent) in each of the last 2 years of study is normally required.

4. Students following the M.Eng. program on a part-time basis should be aware that they will need to take courses offered during normal business hours. (All graduate courses are open to all graduate students.) To obtain credit for a course, a minimum B- standing must be achieved.

5. The instructor in a given course, on the basis perhaps of a written test at the beginning, and in lieu of formal prerequisite requirements, may advise a degree candidate not to take that course.

6. For students taking 7 one-term courses plus a major project, the project must be of an original nature and carried out under the supervision of a senior staff member. The effort required to complete the project should be approximately equivalent to three half courses. The topic of the project should be selected in consultation with the prospective supervisor, and may entail experiments or data collection at the student's place of employment, in the case of part-time students, if suitable arrangements can be made. The project should entail a critical review of the relevant literature, data collection and analysis, and possibly new theory. Successful completion of the Departmental safety course (see section 4.4) is required if the project is experimental.

   The report should be approximately 50 pages long plus relevant appendices. It must be presented and defended before a three-person committee as detailed in section 6, PROCEDURES LEADING TO THESIS DEFENCE, of this handbook.

7. Recognizing that candidates for the M.Eng. degree may not be able to judge the most suitable courses for themselves in the first instance, and not wishing to have candidates drop out of some of their courses for fear of failure, the Department allows each candidate to have up to two failed or incomplete courses, but at least one of these must be retaken and passed. Candidates obtaining 2 failing or incomplete grades will normally have their registration terminated.

2.3 Ph.D. Program

1. The program for the Ph.D. degree involves three elements:

(i) Research involving an original contribution to knowledge and leading to a thesis which is defended at a Final Oral Examination (see SGS Calendar).

(ii) **Ph.D. Course Selection Guidelines**

Please keep these course requirements in mind when selecting your courses and completing the course registration form. **All courses require prior approval by the Coordinator of Graduate Studies and research supervisor.**

Ph.D. Course Requirements:

1) Either:
   a. successful completion of at least 4 one-term courses for those who have already completed an M.A.Sc. degree;
   b. successful completion of at least 1 one-term course for students who by-passed the M.A.Sc. and already have a Master's degree from a non-North American university;
   c. successful completion of at least 3 one-term courses for students who by-passed the M.A.Sc. and do not already have a Master's degree;
   d. successful completion of at least 6 one-term courses for students who enter the Ph.D. program directly from a Bachelor's degree.

2) Ph.D. students are normally required to select courses from engineering or physical sciences departments, but may take a maximum of 1 one-term course from the Faculty of Management Studies. No more than 1 500-level course may be used to meet degree requirements.

3) In the first year of study, students must attend the "How to be an Outstanding Graduate Student Seminar Series"; please consult the schedule. No enrolment in ROSI is required for this seminar series.

4) Successful completion of CHE 2222H (Safety Training Workshop) before embarking on research or teaching in the undergraduate laboratories. The course is offered in September.

5) Successful completion of the Ethics in Research course, JDE 1000H. This course is normally completed in the first year of study.

6) Successful completion of the seminar course CHE 3000Y in **each** year of study.

7) Completion of CHE 2011H - Graduate Student Seminars - in **each** year of study. Students in the following programs are exempt from CHE2011H:
   a. Pulp and Paper field - take CHE 1211H instead
   b. Collaborative Environmental Engineering Program (CEEP) - take EDE3000H instead
   c. Biomedical Collaborative Program (IBBME) – take BME 1010H or BME 1011H instead

8) Successful completion of the annual WHMIS refresher course **each** subsequent year of registration in the program.

9) Students in a collaborative program must normally satisfy the requirements of that program in addition to this Department's requirements.

(iii) Teaching assistance (not mandatory).

2. The program should be completed within two and one-half to three years. (The minimum residence requirement is two years, if the candidate is admitted with a Master's degree.)

3. Admission. Candidates admitted to the Ph.D. program must have demonstrated independent research capability. For this reason, admission is normally restricted to those who have completed the M.A.Sc. program in the Department or its equivalent elsewhere. Candidates who have completed the M.A.Sc. program must also be recommended by the examining committee. Completion of the M.Eng. degree or its equivalent elsewhere, without additional research experience, would not normally allow an applicant to be admitted to the Ph.D. program.

4. Reading Committee. Each candidate, in consultation with his or her research supervisor, is to arrange for the establishment of a Reading Committee at the beginning of his or her program. This committee is to consist of the supervisor and two other members of the graduate faculty, at least one of whom should hold his/her primary appointment from this Department. In addition to the regular consultation between candidate and supervisor, the candidate should seek advice and consultation informally with other members of the Reading Committee throughout his or her program. The committee **must meet every nine months** to review the progress of the research program. For each meeting, the student should prepare a brief progress report and make an oral presentation on the work to date and future plans to complete his/her degree. On the basis of the progress report, the oral presentation and the student's answers to questions, the committee will evaluate the student's performance to date and make recommendations regarding modifications to the research plan or emphasis of the work. The student should sign the evaluation form and pick up a copy of it from the Graduate Office (Room 212). The committee has complete authority to recommend the termination of a student's degree program if adequate progress is not demonstrated. Ph.D. students should note that they are now required to give the date of their last Reading Committee Meeting on their enrolment forms. These forms will not be signed by the Coordinator of Graduate Studies if the Reading Committee has not met as scheduled. Should there be extenuating circumstances preventing a Reading Committee meeting at the scheduled time, the student should notify the Coordinator of Graduate Studies, in writing, of the circumstances and request permission to delay the meeting.

   The committee will also meet with the candidate to offer advice on the written thesis before the Departmental Oral Examination which precedes the Final Oral Examination.

5. The Thesis. It is recommended that the thesis be no longer than 200 pages, double-spaced, plus relevant appendices. If the student believes that the thesis should be significantly longer than 200 pages, then he or she should consult his or her Reading

Committee and the Coordinator of Graduate Studies (see item 4 above). Students are cautioned that should they wish to deviate from a normal thesis length and format (i.e., the thesis being the primary focus of the research work), they may encounter problems due to the number of faculty involved in examination of the thesis. Planning of the format and length of the thesis should be carried out in close consultation with the supervisor and Reading Committee. Ideally a one page plan (contents page) should be submitted to the Reading Committee before writing commences. **Students are advised to refer to the copy of the pamphlet, Guidelines for the Preparation of Theses for Microfilming and Binding, (see Section 2.4) and Ph.D. Thesis Requirements, Section 2.5, both published by SGS, before typing the thesis. Theses which do not conform to these guidelines will NOT be accepted by SGS.**

6. Course requirement. Each candidate who holds a master's degree in engineering or the physical sciences must take at least four (one-term) courses as part of his or her program, and may take up to six courses without special permission of the thesis supervisor. Candidates who do not hold a Master's degree in engineering or the physical sciences and who bypass the M.A.Sc., must take a total of 6 one-term courses.

7. Residence. The candidate should remain in continuous residence until the Departmental recommendation for the Final Oral Examination has been made. If continuous residence is not maintained, the Reading Committee and Departmental oral may be withdrawn, and the candidate may be required to appeal to the Dean of the School of Graduate Studies to schedule the Final Oral Examination.

2.4 Guidelines for the Preparation of Theses for Microfilming and Binding

Information about the SGS requirements for theses can be found on the web at the following address: http://www.sgs.utoronto.ca/current/thesis/index.asp. These are in addition to the Departmental requirements to be found in the document Writing for Engineers, available in the Graduate Office. Please review these documents before writing your thesis and be sure to conform to the requirements.

2.5 Ph.D. Thesis Requirements

The general requirements for Ph.D. theses are described in the SGS calendar under the heading "Degree Regulations/Doctor of Philosophy". These regulations require that the thesis be published, at least in the form of being sent for microfilming. The rules indicate the intention that all theses should be published and distributed without restriction. It is possible in exceptional circumstances to limit the distribution and publication for two years or conceivably five years. This has several implications.

1. A thesis will not be accepted in partial fulfilment of a Ph.D. degree if someone, perhaps the granting agency, or industrial participant, prohibits absolutely its publication.

2. If a thesis contains more than brief excerpts of material that has previously been published, the candidate must supply written permission from the copyright holder to publish in microfilm.

3. If the thesis contains material by multiple authors, the candidate must obtain permission to publish by all of the authors.

If the thesis contains a collection of several papers, the collection at a minimum should have a coherent topic with an introduction presenting the general theme of the research and a conclusion summarizing and integrating the major findings.

The format of the thesis must be a printed or typed document in a standard format that can be easily reproduced or microfilmed (see SGS thesis guidelines). It is not acceptable to staple together several reprints.

Where someone other than the candidate is a co-author of any portion of the thesis, this fact should be clearly indicated in the introduction, which should also state the actual contribution of the candidate to the work. The examination committee must be satisfied that the candidate's personal contribution to the thesis is sufficient to fulfil the requirements of the PhD degree. A candidate who intends to submit jointly authored work must be prepared to satisfy the committee on this issue. A statement from the co-author as to the candidate's contribution may be helpful. For more specific details on thesis length and format, etc., see section 2.3, item 5, also.

3. UNIVERSITY POLICIES

The following university policies are of particular importance to graduate students. There are many other policies which also affect your status as a graduate student and responsible member of the university community. They are to be found in the School of Graduate Studies Calendar which is given to you when you register. ***It is the student's responsibility to become familiar with these policies.***

3.1 Inventions and Copyright Policies

Copies of these policies are to be found in the Office of Research Administration, Simcoe Hall and on the SGS website, http://www.utoronto.ca/govcncl/pap/policies/invent.html. In essence these policies state that all inventions "must be disclosed to the University Inventions Committee. Software must be so disclosed before any initiatives to commercialize it. If an invention arises or is pursued by the student for thesis work, or under payment of a scholarship or internal award of the University, the University owns the invention, but the student gets a share of any revenues resulting from it. If data or software arises or is pursued by the student under "employment", the University owns it."

3.2 Sexual Harassment

Sexual harassment is not tolerated by the University of Toronto, and the University's Policy is clearly outlined in the SGS Calendar. Anyone who needs clarification of the policy or wishes to discuss a matter related to this policy should contact the Sexual Harassment Office located at 40 Sussex Avenue, Third Floor (416-978-3908).

3.3 Code of Behaviour on Academic Matters and Code of Student Conduct (http://www.sgs.utoronto.ca/current/index.asp)

The University of Toronto has outlined clearly in the SGS Calendar what it considers to be academic and non-academic offences for which students will be sanctioned.. The offences and penalties are listed in the respective codes under the General Regulations of the SGS Calendar. Students should become familiar with these codes as a plea of ignorance will not be acceptable. Students' attention is drawn particularly to the University's stand on plagiarism.

3.4 Plagiarism

Plagiarism is a serious offence in any university and sanctions for students caught plagiarizing material range from a penalty of double the value of the work to expulsion. Generally "to plagiarize" is defined as: ""to appropriate and pass off (the ideas or words of another) as one's own." (The New Penguin English Dictionary, Penguin, 1986.) Students are often confused about the rules for citing the work of others. Please refer to the following website for detailed information on these rules: http://www.utoronto.ca/ota/issues/plagsep.html

The document found there is entitled ""How Not to Plagiarize" by Margaret Procter. In summary:

1) Information that is generally available from a wide variety of sources need not be referenced. You do not have to give a reference when you use the Ideal Gas Law, for example.

2) Information (facts or ideas) taken from a specific author or document does require a footnote or (more usually) an endnote placed at the point of citation in the text. [An "endnote" is commonly referred to as a "reference" in the scientific literature, and appears at the end of a document. Endnotes are listed either in the order cited or in alphabetical order, depending on the convention used.]

3) Using more than a few words in a row that are not your own requires both an endnote and quotation marks surrounding the borrowed text. Borrowed diagrams must be cited with an endnote in the figure caption. [Note that the use of diagrams or tables from published sources in your own document may also require a copyright release. This is a completely separate issue, but is also important when you are publishing your work (i.e. a journal paper, book chapter, or even a thesis)].

4) Listing a source in a general bibliography does not eliminate the requirement for endnotes as detailed above. Bibliographies are seldom used in scientific papers in any case.

Please speak to the Coordinator of Graduate Studies, your supervisor or your course instructor if you have any questions about these rules. Always err on the side of caution by using a citation if in doubt. Claiming ignorance of the proper rules of citation is not a defence against a charge of plagiarism.

4. SAFETY REGULATIONS

Students should have a copy of the **Department's Safety Manual for Researchers and Research Supervisors**. General safety policies, the departmental safety manual, documents, and forms can be accessed at www.chem-eng.utoronto.ca.under Services/Resources – Health & Safety.

4.1 Safety

In this Department, as in other engineering and science Departments, one will encounter many hazardous situations and materials such as flammable solvents, toxic chemicals, compressed gases and electrical apparatus. While steps have been and are being taken to reduce the number of such hazards, many will continue to exist, since they are an inherent part of our laboratory teaching and research. Every member of the Department, including all staff and all students, must work towards minimizing the number and scale of hazards and the probability of the occurrence of accidents. This section summarizes key points of policy and procedure with regard to occupational health and safety in the context of work and study in the Department.

4.2 Individual Responsibility

It is the common law that each individual owes a duty to work and study in a manner which does not jeopardize the health and safety of others.

4.3 The Occupational Health and Safety Act

In addition to the duties required under the common law, the Department, as a work place, is subject to the requirements of the Occupational Health and Safety Act (Ontario, 1978). It is Department policy that all members of the Department are subject to the procedures established in order to comply with the Act. Copies of the Act are available through the Department, and a copy is prominently displayed on the notice board outside Room 215.

A requirement of the Act is the establishment of a Departmental Joint Occupational Health and Safety Committee. The membership of this Committee is posted on the notice board outside Room 215.

The Committee is concerned with the development of policies and procedures designed to reduce risks in the Department. If a student or staff member believes a situation to be unsafe, then he/she must report this to a member of the Committee, preferably the Chair.

4.4 Training

It is mandatory for all new researchers - M.A.Sc., Ph.D. and M.Eng. students (with the option of a project) - to register on ROSI in CHE 2222H. All graduate students admitted to the Department are **required** to receive instruction in laboratory safety as part of their academic training. This instruction consists of a two-day training session at the commencement of the graduate program, plus WHMIS refresher courses which must be attended **during each year while the student is in full-time attendance** at the University. Information about this course will be posted on the notice board outside Room 212, and is announced in the weekly Departmental Newsletter. Graduate students **must** pass a safety examination before they are permitted to undertake experimental work or act as a teaching assistant in undergraduate laboratories.

Effective September 2006, the University requires that all researchers working with **any biohazard material must attend the University's biosafety training course** offered through the Biosafety Office of the University's Environmental Health & Safety Office. Please check their website for posted dates of courses:
http://www.ehs.utoronto.ca/services/biosafety/Biotrain.htm

4.5 Workplace Hazardous Materials Information System (WHMIS)

Under the WHMIS regulations, every worker has a right to know about the physical, chemical and biological hazards which exist in teaching and research laboratories. All laboratories are now required to keep up-to-date inventories of hazardous materials, identify them with labels and provide hazards information in the form of Material Safety Data Sheets (MSDS). All personnel are **required** to participate in annual WHMIS training sessions (see 4.4).

If your work involves the use of hazardous materials, obtain a copy of the MSDS for each material from either the supplier, the University Health and Safety website (http://www.utoronto.ca/safety/info.htm) or from a file kept in Room 16. Read the information and become familiar with the nature of hazards and precautionary and first-aid measures before you start working with the material. MSDSs can also be accessed via the internet; several WEB sites are available. The website at http://siri.uvm.edu/ is especially useful.

Additional information on safe laboratory practices, toxicity of chemicals, and flammability of solvents is available in the Safety Reference Library established in Room 215.

4.6 Safety Equipment

Laboratories are equipped with protective and other equipment including fume hoods, fire extinguishers, fire blankets, showers and eye-wash fountains. Students and staff must familiarize themselves with the locations and uses of these. It is essential that you have a plan of action to follow in the event of an accident in your laboratory. Don't wait for an accident to decide what to do.

Personal protection, such as goggles, gloves, lab coats, and hard hats are required in certain laboratories.

4.7 Working Outside of Normal Hours

In order to complete a graduate research program in a reasonable amount of time, it is necessary that graduate students work in their laboratories outside of "normal" working hours. On such occasions, it is **required** that you employ a buddy system in which several people watch out for each other's safety. To ensure that help can get to you in the event of an accident, it is wise to leave your laboratory door unlocked when you are working. If a locked door must be opened in an emergency, dial the emergency number 82222 and explain the problem. It is Departmental safety policy that the window in the door of your laboratory be left uncovered. During normal working hours, keys for locked Rooms can be obtained from the General Office, Room 217. When leaving the building after hours, you are encouraged to make use of the Walksafer Program operated by the University by calling 978-SAFE. An escort will walk with you across campus to subway stations or bus stops.

4.8 Transportation of Gas Cylinders, Cryogenics & Containers of Toxic or Flammable Chemicals

Gas cylinders and glass containers of toxic and flammable chemicals must be labelled as to contents and may be moved around the building using approved methods only. **On no occasion may a gas cylinder or any container of toxic, flammable or cryogenic material be carried in the passenger elevator**, which is not ventilated.

4.9 Storage of Flammable Liquids and Disposal of Wastes

The Department has strict rules governing the sizes and types of containers used for flammable liquid storage, and rules governing the quantities of flammables that can be stored in a laboratory. Fires are a serious risk in the Department. Researchers are expected to abide by all guidelines and regulations regarding the deposal of wastes. The department has established a procedure for handling and disposal of wastes. Please refer to the Safety Manual for details of the procedure. Labels and log sheets are available from Leticia Gutierrez in Room 217 and Terry Bunting in Room 16.

4.10 Registration of Experimental Work

Departmental policy requires that a safety assessment be carried out by a researcher when undertaking a new research project or when making major changes to an existing procedure. All researchers, whether performing experimental or theoretical/computer work, must complete an Experimental Registration Form prior to conducting their research. Forms for this purpose are available from Leticia Gutierrez in Room 217 and on the Department's website: www.chem-eng.utoronto.ca.under Services/Resources – Health & Safety. The registration form must be discussed with one's supervisor, authorized by him/her, and handed in Room 217 for the approval of the Departmental Safety Committee. The registration form normally expires on July 31, and must be renewed on an annual basis. Failure to submit a new Experimental

Registration Form or secure a renewal of the current Experimental Registration Form may lead to a loss of laboratory privileges and/financial stipend or pay.

4.11 Designated Substances

Certain substances have been designated by the Ministry of Labour as particularly hazardous. This Department has also identified additional chemicals which require careful control. To ensure safe use of these substances, specific authorization must be obtained from the Chair of the Departmental Joint Occupational Health and Safety Committee to use the following:

acrylonitrile	formaldehyde
arsenic	isocyanates
asbestos	lead
benzene	mercury
carbon disulfide	silica
carbon tetrachloride	styrene
ethylene oxide	vinyl chloride
hydrogen sulfide	cyanide
cadmium	

Application forms for permission to use designated substances are available from Leticia Gutierrez in Room 217.

4.12 Surveillance of Experiments

In normal circumstances an experiment should not be left unattended. If the experimenter has to leave the laboratory temporarily, the experiment must be left in a safe condition (turn-off or adequate turn-down). At the end of the day or at the termination of an experiment, it must be shut-off. If it is necessary to run an experiment overnight, express permission must be obtained from one's supervisor and the Chair of the Departmental Joint Occupational Health and Safety Committee. Approval is in the form of a signed certificate to be posted prominently on the laboratory door. Leticia Gutierrez (Room 217) has a supply of these certificates.

4.13 Smoking, Eating and Drinking

These activities are confined to certain areas. **In no case are they permitted in laboratories or areas where flammable, toxic or radioactive chemicals are in use.** With respect to smoking, the Department, in conformity with the City of Toronto Smoking By-Law, has developed the policy that this is a smoke-free building! No one is permitted to smoke in any Room in the building. Complaints or disputes regarding the smoking policy or its enforcement should be referred to the member of the Safety Committee.

4.14 Restricted Areas

Admittance to certain areas, in which ionizing and non-ionizing radiation and other hazards exist and are clearly labeled, is banned except for those persons specifically authorized.

4.15 Restricted Actvities

For everyone's safety, certain activities are prohibited or restricted:

1. Horseplay is forbidden in all laboratories;
2. Roller blades/Roller skates/skateboards cannot be used in any University building.

4.16 Accident/Incident Reports

All accidents/incidents must be reported within 24 hours, on the standard form, to the Secretary of the Departmental Joint Occupational Health and Safety Committee, Leticia Gutierrez, in Room 217. A report must be filed for personal injury accidents, chemical spills, fires, and for any incident **with the potential** to cause injury, whether or not injury resulted. Accident/incident report forms can be obtained from Leticia Gutierrez in Room 217.

4.17 Emergency Procedures

In case of FIRE the University policy is:

1. Actuate the nearest wall-mounted fire alarm.

2. Telephone the University Emergency Centre, Local 82222.

3. Evacuate the building.

4. Report to fire inspector if anyone is suspected of being in the building after general evacuation, also location of fire, if known.

When fire alarm sounds proceed as follows:

a. Evacuate the building quickly even though alarm is suspected or known to be false. (N.B.: It is mandatory for all University buildings to be evacuated upon sounding of the building fire alarm.)

b. Do **not** use elevators.

c. Do **not** re-enter building until authorized to do so by Fire Officer.

d. Keep clear of the building.

In case of EXPLOSION or UNCONTROLLED RELEASE OF TOXIC CHEMICALS, the above procedures will also be followed.

4.18 Information on Occupational Health and Safety

Further information may be obtained from:

(i) http://www.utoronto.ca/safety/info.htm
(ii) www.chem-eng.utoronto.ca.under Services/Resources – Health & Safety
(iii) The University of Toronto Office of Occupational Health and Safety, 7th Floor, 215 Huron Street, 978-4467.
(iv) Members of the Departmental Joint Occupational Health and Safety Committee (see Leticia Gutierrez, Room 217).

5. PROGRAM REGULATIONS AND PROCEDURES

The information in this section is provided to assist new students in particular in untangling the red-tape involved in getting started. Some of the information may already have been sent to you by SGS. We hope this will help make the information "user friendly". Although the information has been prepared with the new student in mind, it can also serve as a useful reminder for continuing students!

5.1 Fee Payment and Registration

M.A.Sc./Ph.D.: Incoming M.A.Sc. and Ph.D. students who are receiving a research stipend may defer their fees until April 15th, 2008. To defer fees, complete a "Fee Deferral Form" from the Forms page of the School of Graduate Studies website (http://www.sgs.utoronto.ca/current/studentforms/index.asp), and submit it to the Graduate Office in the department: Room 212 of the Wallberg Building. You can also fax the completed form to us at 416-978-1376.

Fee deferral forms are due by **September 10th, 2007 at the latest**.

For more information on how to pay fees, please visit: http://www.fess.utoronto.ca.

M.Eng. students who plan to take courses or work on a project during the Summer session must register for that session. This involves filling out a form that is available in the Graduate Office (Room 212). **Prompt summer registration ensures that your status as a student is maintained, and your education tax deduction for the summer assured**. There is no tuition fee for the summer session for those registered in **both** of the previous terms.

M.A.Sc. and Ph.D. students register for both the winter and summer sessions when they register in the winter session.

5.2 Grading and Evaluation

Students are referred to the SGS Calendar, General Regulations section, GRADUATE GRADING AND EVALUATION PRACTICES POLICY, for information relating to grade scales and grading procedures (including appeals).

Students who need official transcripts should order them either through ROSI, or from the University of Toronto Transcript Centre located in the Sidney Smith Building, 100 St. George Street. Students may also access their grades and standing in courses via ROSI.

Students should be aware that the minimum passing grade for a graduate course is B-. The minimum passing grade for graduate students in a '500 level' course is also a B- (70%). Any grade below 70% will be considered an F.

5.3 Appeals

A Departmental Graduate Appeals Committee exists to handle disputes over "substantitive or procedural academic matters, including grades". Should such a dispute arise, the student should first approach the course instructor or person whose ruling is in question; then the Coordinator of Graduate Studies, then the Department Chair. Should the problem not be resolved at any of these stages, the student can appeal to the Graduate Appeals Committee not later than 6 months after the ruling in question or the reporting of the grade.

If the dispute is still not resolved, the student may make formal appeal to the Graduate Academic Appeals Board of SGS. Further information regarding this later step may be found in the SGS Calendar, General Regulations section, under the heading **Academic Appeals**.

5.4 Orals and Theses

Each student in a degree program (M.A.Sc., M.Eng., Ph.D.) must have an oral defence of the research or project work which is part of the degree requirements. There are specific regulations which govern the defence procedure, and these may be found in sections 2 and 6. All degree students should become thoroughly familiar with these regulations.

There is no set duration for a graduate oral; however, most orals are completed within 2 hours. Therefore, students should schedule at least 2 hours for the oral.

For information about the number of copies of the thesis required, please see section 6.4.

6. PROCEDURES LEADING TO THESIS DEFENCE/BYPASS ORALS/Ph.D. QUALIFYING EXAMINATION

The supervisor and student, in consultation with the Coordinator of Graduate Studies, select the members of the examining committee and arrange a date and time convenient for all members, including the Chair of the examination (for Bypass and Qualifying examinations). In the case of the Final Ph.D. Oral, once the Coordinator of Graduate Studies has approved the external appraiser/examiner, the supervisor must contact that individual to get his/her agreement to serve. Students should bear in mind the vacation period for professors (normally July and August, and the University holiday shut-down in December) when arranging an oral

examination. Convening a committee during this period can be difficult. Students are also advised not to push Convocation deadline dates!

Copies of the thesis/research proposal should be distributed to the members of the examining committee at least two weeks in advance of the date of the oral. Senior staff may refuse to participate in an oral examination if less time is given for the appraisal of the thesis.

The supervisor or student shall notify the Coordinator of Graduate Studies of his/her intention to hold an oral examination by completing a form available from Departmental website at http://www.chem-eng.utoronto.ca/graduate/currently_enrolled_students.htm. Notice of all orals will be published in the Department's weekly publication, CHEM ENG NEWS. All M.A.Sc. and M.Eng. orals are normally open to Departmental faculty and graduate students.

Pauline Martini or Joan Chen will give the student a form to be signed by various members of the Department to signify that all keys, equipment, tools, safety materials, etc., have been returned or accounted for. This form must be completed and returned before a candidate can be recommended for graduation. There is an overhead projector in the Graduate Office (Room 212) for use at Departmental orals and Reading Committee Meetings. As well, a laptop computer and projector is available from the main office, Room 217 (see Leticia Gutierrez).

6.1 Conduct of M.A.Sc./M.Eng. Orals

1. The M.A.Sc./M.Eng. Oral Committee (see above) will consist of those most knowledgeable of the candidate's area of research. The composition of the committee will normally consist of members of the graduate faculty as follows: (i) the supervisor(s); and (ii) two other faculty members, one of whom must be from this Department.

   The Chair of the Oral Committee will be appointed by the Coordinator of Graduate Studies before the oral from one of the non-supervisory members.

2. Pre-Oral Review

   At the start of the oral the candidate will be asked to leave the Room whilst the following procedures are carried out (checklist provided).

   (a) The Chair will briefly review the relevant Departmental Policies related to the M.A.Sc./M.Eng. program (provided by the Graduate Office).

   (b) The Committee will review the length of time that the student has been in the M.A.Sc. program.

   (c) The Committee will review the student's course performance.

   Information pertaining to items (b) and (c) will be provided by the Graduate Office on a synopsis/recommendation form.

3. Oral Examination

(a) The candidate and any graduate student observers will then be asked to enter the Room, and the candidate will make a 20 minute presentation on his/her research.

(b) The committee members will then question the student on his/her research. Student observers may also ask questions.

(c) At the end of the question period, the candidate and any observers will be requested to leave the Room.

4. Post Oral Review

(a) On the basis of the thesis and the oral defence, the committee may recommend that the candidate be awarded the M.A.Sc. degree. The synopsis/recommendation form is then signed by the chair and submitted to the Graduate Office.

(b) The committee may recommend that the candidate be awarded the degree subject to minor modifications of the thesis. The committee chair must subsequently provide a letter stating that the necessary modifications have been made.

(c) If the candidate's thesis and/or research is unsatisfactory, the committee may recommend that the candidate be given an opportunity to address shortcomings in his/her thesis or defence with the objective of a reconvened oral being held at a later date, or that the candidate withdraw from the program.

(d) In the case of an M.A.Sc. oral, the qualifications of the candidate for a Ph.D. program should be reviewed at the meeting. However, the actual recommendation will be made by individual ballot. Each member of the committee should complete a ballot at the Graduate Office within three days of the meeting, bearing in mind the following Departmental guidelines:

(i) A student wishing to proceed to the Ph.D. program is normally expected to complete the M.A.Sc. program in four consecutive terms.

(ii) **The student must obtain a B+ average in the 3 required courses.** Students failing a required course would not normally be eligible for proceeding to a Ph.D. program.

(iii) Although no official grade is given to the thesis and its defence, **the overall B+ average required by SGS at the master's level for procedure to a Ph.D. program will be taken into account.**

The following categories will be offered on the ballot:

Highly recommended for a Ph.D. program;

Recommended for a Ph.D. program;

Not recommended at this time for a Ph.D. program.

Following the oral examination, the student should make all corrections to the thesis as required by the examining committee. Once the supervisor approves the corrected thesis, the student should submit copies as follows:

For M.A.Sc. students: 1 unbound copy to School of Graduate Studies; 2 bound copies to the Department (see Leticia Gutierrez, Room 217); and 1 bound copy to each supervisor.

For M.Eng. students: 2 bound copies to the Department (see Leticia Gutierrez); and 1 bound copy to each supervisor.

A signed library authorization form (available from the SGS website) is to be bound facing the front cover of the Departmental copies of the thesis. The School of Graduate Studies (SGS) requires a signed library authorization form as well as a signed Non-Exclusive Licence to Reproduce Theses form (available from the SGS website) along with the unbound copy of M.A.Sc. theses. There is a charge of $42.89 (payable to School of Graduate Studies) for microfilming the M.A.Sc. thesis (see Section 2.4, Guidelines for the Preparation of Theses).

6.2 Conduct of Bypass Orals

The procedure for the bypass oral will be the same as for the M.A.Sc. oral with the following exceptions:

(i) The M.A.Sc. Bypass Oral Committee will have one additional faculty member appointed by the Coordinator of Graduate Studies. This member will also serve as the Chair of the Committee.

(ii) The categories offered on the ballot for the bypass oral will be as follows:

Highly Recommended for a Ph.D. program;

Not Recommended at this time for a Ph.D. program.

A consensus decision is required for the student to transfer to the Ph.D. program. The ballots will be read by the Committee Chair during the post oral review, so the candidate can be informed of the decision.

6.3 Conduct of Ph.D. Qualifying Exam

1. The Ph.D. Qualifying Exam has a very similar format to the M.A.Sc. Bypass Oral. Therefore, successful completion of the M.A.Sc. Bypass Oral is an equivalent substitute for the Ph.D. qualifying exam.

2. The Ph.D. qualifying exam committee will have the same structure as that for the M.A.Sc. Bypass Oral. It will consist of the reading committee members (supervisor(s) plus 2 other faculty) as well as an independent faculty member from our department appointed by the graduate co-ordinator. The independent faculty member will be selected with the field of study in mind and he/she will also act as chair of the exam.

3. The exam will be based on a research proposal (< 30 pages double-spaced, introduction to conclusions) and 20 minute oral presentation. The format of the exam will be the same as that used for an M.A.Sc. bypass oral.

4. The exam should be taken after being in the Ph.D. program for 9 months and it must be completed before 12 months in order to maintain registration and funding.

5. A consensus decision is required by the committee for the student to pass. The assessment (pass/fail/retake) will be based on the student's research proposal (written and oral) and its defence as well as his/her grades in courses.

6. Unsuccessful students may be allowed one more chance at the exam, subject to the discretion of the committee. The second exam must normally be taken within 4 months of the first exam.

6.4 Conduct of Ph.D. Orals

The Ph.D. oral examination is a three-phase process.

1. Reading Committee* Meeting. The student and supervisor should arrange a meeting of the Reading Committee to discuss the thesis and decide whether the student should proceed to the Departmental Oral Examination. At this final Reading Committee meeting, the members decide on three possible candidates for external examiner/ appraiser. The student is responsible for providing copies of the thesis (see Policy re Thesis Preparation Costs, section 6.5). The supervisor should notify the Coordinator of Graduate Studies of the outcome of the meeting.

2. Departmental Examination. The examining committee should be comprised of the members of the Reading Committee and at least one, preferably two, additional senior staff member (usually from this Department). The Coordinator of Graduate Studies will appoint a Chair from the Reading Committee exclusive of the candidate's main supervisor. The supervisor should notify the Coordinator of Graduate Studies of the outcome of the oral.

3. Final Oral Examination. The regulations governing this examination are determined by the School of Graduate Studies and are outlined in detail in the SGS calendar. Students are advised that at least 9 weeks' notice is required to set up a final oral. Once approval has been given for the student to proceed to the final oral, the supervisor, in consultation with the student, nominates the members of the examining committee. This committee is comprised of a minimum of five voting members, as follows: (a) three (maximum) members of the Reading Committee; and (b) one to three other members of the graduate faculty; and an External Examiner, who have not been closely associated with the research. The following are the steps to be taken in the nomination process:

   Step 1. On a form available from the Departmental website at www.chem-eng.utoronto.ca/graduate/currently_enrolled_students.htm, the supervisor lists, in order of preference, the names of three potential external examiners/appraisers agreed upon by the Reading Committee. A brief justification for **each** nominee is required. Note that, consistent with SGS policy, the external examiner should (a) be at the rank of Associate Professor or Professor; (b) be at arm's length from the thesis; and (c) not be a collaborator with the supervisor or the student. Research profiles of each must be submitted along with the form to the Coordinator of Graduate Studies who will choose the most appropriate individual and return the form to the student or supervisor. **The supervisor then contacts that individual and obtains (a) his/her agreement to serve as external examiner or appraiser and (b) possible dates and times for the oral examination**. In order to maintain an arm's length relationship, the supervisor must limit contact with the external examiner to getting his/her agreement and setting up a

*See Departmental Policies on Graduate Programs, Section 2.3, Item 4.

date and time for the oral. **It is forbidden for students to contact the external appraiser/examiner before the oral examination**. This means that students cannot contact the external examiner/appraiser to arrange a date and time for the oral.

Step 2. The supervisor and student complete the form and return it to the Coordinator of Graduate Studies. At this stage the form should include the names of the remaining members of the examining committee and the date and time of the oral, any request for projection equipment, and the field of study. In addition, a c.v. of the external examiner must also be submitted. This an SGS requirement. The c.v. may be a printout from a website if the website contains the following information: affiliation, up-to-date publication list, employment history. The supervisor is responsible for obtaining the agreement of all members to serve on the examination committee. The student is responsible for arranging a suitable date and time for all members of the committee.

Step 3. The above information along with a certification of completion is forwarded to SGS for approval by the Vice Dean, Programs, at SGS, and a Room for the oral is booked. A chair for the final oral is appointed by SGS.

The student is responsible for distributing his/her thesis to members of the examining committee. As there is to be no communication with the External Appraiser prior to the examination, the student must provide a copy of the thesis to the Graduate Office, who will forward it to the External Appraiser. Please note that the Graduate Office must receive the thesis at least seven weeks in advance of the date of the oral to provide sufficient time for the Appraiser to receive, review, and appraise the thesis. The appraisal is received by the Graduate Office, and forwarded to the student at least two weeks prior to the examination. The Department will send a copy of the appraisal to SGS and the examining committee.

To avoid prejudicing the result of the examination, and to ensure that the defence of the thesis is his/her own work, the candidate may not discuss the appraisal or the examination with members of the Examination Committee until the examination is underway.

Step 4. Post Oral

After the oral examination, the candidate must return to the Ph.D. Orals Office where several documents have to be signed. The candidate should also return to the Departmental Graduate Office (Room 212) and pick up a completion form. This document must be signed by the people indicated and returned to the Graduate Office by the assigned date. Bound copies of the thesis and the completion form should normally be returned to the Department before graduation.

6.5 Policy re Thesis Preparation Costs

The following is a statement of guidelines with respect to responsibilities for costs incurred in the preparation of theses:

1. (a) M.A.Sc.

The student is responsible for the preparation of at least four copies of the thesis: one **unbound** copy for the School of Graduate Studies; two bound copies for the Department (see Leticia Gutierrez, Room 217); and one bound copy for the Supervisor. In cases of joint supervision, each supervisor is to receive a bound copy of the thesis.

Should the Supervisor require copies beyond the minimum number, then the Supervisor is responsible for the cost of these. The Supervisor will also cover the cost of drawings and photographs which have been, or will be, used in publication. The responsibilities of the Supervisor in this respect will normally be met from research funds.

The Department covers the incremental cost of a second Departmental copy bound in stiff-board binding (costs approximately $19.00).

In addition, the Department will provide a $50 subsidy towards the actual costs incurred by the student, provided the degree has been earned on a "full-time" basis, and the oral examination is completed within two months of the student leaving to begin employment.

(b) M.Eng.

The above guidelines for M.A.Sc. theses also cover M.Eng. theses except that M.Eng. students need only provide three bound thesis copies -- two for the Department and one for the Supervisor.

(c) Ph.D.

The guidelines are similar to those above for M.A.Sc. theses, except that:

(a) the student provides SGS with 1 unbound copy of the thesis; the Department with 2 bound copies; and one copy for each supervisor. The SGS copy is sent to the National Library for microfilming and is bound by the Robarts Library when it is returned. The student pays SGS a fee of $15 to cover binding costs at the time of submission of the thesis.

(b) the Department will cover the photocopying costs associated with the three preliminary copies of the thesis to a maximum per copy of 200 pages plus appendices required by the Reading Committee which meets prior to the Departmental oral. Charges for pages in excess of this must be paid for by the Supervisor. These copies must be made on the photocopying machine in Room 16 and charged to the Graduate Department.

(c) The Department will provide a $150 subsidy towards the actual costs incurred by the student, provided the degree has been earned on a "fulltime" basis, and the final oral is completed within two months of the student commencing full-time employment.

2. NO MONIES WILL BE PAID UNTIL THE REQUIRED NUMBER OF BOUND COPIES HAS BEEN RECEIVED IN THE GRADUATE OFFICE AND AN AUTHORIZATION SLIP IS RECEIVED SIGNED BY THE COORDINATOR OF GRADUATE STUDIES.

ALL ORIGINAL RECEIPTS FOR COSTS MUST BE PRESENTED BEFORE YOU CAN BE REIMBURSED. These receipts are to be attached to a completed Expense Reimbursement Form and then should be given to Arlene Fillatre or Leticia Gutierrez in Room 217. Please keep in mind that a “transaction record” of a credit card or debit card purchase is NOT A RECEIPT. A proper receipt lists what was purchased as well as any taxes paid. Transaction records do not give that information – they merely report a total.

The Departmental copies may be bound in stiffboard binding (recommended colour: blue).

7. FINANCIAL SUPPORT

There are five main sources of financial support in the Department: scholarships [Natural Sciences and Engineering Research Council (NSERC), Ontario Government Scholarships (OGS), Ontario Government Scholarship in Science and Technology (OGSST)], University of Toronto (U. of T.) Fellowships (including Connaught Scholarships), Differential Fee Waivers (DFW), stipends and teaching assistantships.

- External Scholarship (e.g., NSERC, OGSST, OGS)
  - a cash award
  - normally paid in one to three instalments per year
  - awarded based on academic merit
- U. of T. Fellowship
  - a cash award
  - normally paid in one to three installments per year
  - awarded based on academic merit and financial need
- Differential Fee Waiver (DFW)
  - awarded to visa students
  - no cash value
  - allows visa students to pay domestic fees
- Stipend
  - monthly payment
  - funded by the student’s research supervisor while the student is working on his/her thesis project
- Teaching Assistantship
  - earned income

- paid monthly
- paid for work in laboratories and tutorials based on an hourly wage

7.1 Stipends

Individual professors in the Department apply for and receive grants to support their research programs. A large proportion of these funds are spent on student stipends. Ultimately, graduate students are responsible for negotiating their own stipend directly with their prospective research supervisor. Effective May 1, 2003, financial support for a typical graduate student in the M.A.Sc. or Ph.D. program will total $20,600. This will be made up of a stipend of $19,500, plus $1,100 from a Teaching Assistantship (about 40 hours). If you prefer not to accept a Teaching Assistantship (TA) position, your support will be $19,500. If you accept a TA position of more than 40 hours (see 7.3 below), your total support will increase accordingly. We allow students to teach for up to 100 hours/year, and the current (as of Jan. 1, 2007) rate of pay for teaching assistants is $35.29/hr. for Ph.D. students and $33.80/hr for M.A.Sc. students. Graduate students with fellowships valued less than $19,500 normally receive an additional stipend.

Subject to satisfactory performance, the stipend for an M.A.Sc. program is normally provided for a period of up to 18 months, and that for a Ph.D. program is normally provided for up to 42 months. Support beyond these periods is subject to individual consideration, but may not be forthcoming.

Financial support can be withdrawn as a consequence of unsatisfactory performance, subject to one-month's written warning. Such a decision to withdraw support can be appealed to the Chair of the Department.

The final terms of financial support negotiated between the supervisor and student should be communicated in writing by the supervisor to the student. Students are invited to contact the Coordinator of Graduate Studies for advice regarding their financial arrangements.

7.2 Scholarships and Fellowships

Graduate students are expected to apply for scholarships. The three main sources of scholarships are: the Natural Sciences and Engineering Research Council (NSERC), Ontario Government Scholarship program (OGS), Ontario Government Scholarship for Science and Technology (OGSST) and the University of Toronto Fellowship program. A few students each year are supported by other scholarship programs. **It is the responsibility of the student to ensure that they meet the award requirements (e.g., citizenship, tine in degree program, etc.) before they apply**.

NSERC, OGSST and OGS Awards:

Information about the NSERC, and OGS programs usually becomes available in September, and in March/April for the OGSST. This information is sent via e-mail, posted on

the Bulletin Boards and/or published in the Departmental Newsletter, CHEM ENG NEWS. All students are encouraged to apply for external scholarships if they meet the eligibility requirements. **Connaught Scholarship holders are required to apply for OGS awards in order to have their awards renewed**. Visa students may apply for OGS awards, but NSERC and OGSST awards are restricted to Canadian citizens and landed immigrants. Scholarships are awarded on the basis of merit and other criteria set by each granting agency. Other fellowship information is posted on the Bulletin Board as it becomes available.

NSERC, OGSST, OGS, and Connaught Scholarship winners will receive supplementary income in the form of a stipend or U. of T. Fellowship. This supplementary income will normally be available for the tenure of the scholarship. NSERC scholarship winners will receive an amount equal to the academic fee in the year in which they hold the award. OGSST, OGS and Connaught Scholarship winners will be given additional support to bring the total value of their award to a fixed amount, which is currently equal to $21,000 for M.A.Sc. students and $22,000 for Ph.D. students.

University of Toronto Fellowships.

All currently enrolled graduate students who have maintained a B+ average in course work are considered for University of Toronto Open fellowships which are administered by the Department. These fellowships are awarded on the basis of merit and financial need. Students receiving these awards will have reduced stipends from their research supervisors, such that their total support is equivalent to the Departmental norm (currently $19,500), or the amount agreed to in advance. Students enrolled beyond the second year of a Master's program or the fifth year of a Ph.D. program are not eligible to hold a U. of T. Fellowship.

Differential Fee Waiver:

In addition to fellowship and/or stipend support, visa students normally receive a Differential Fee Waiver which enables them to pay lower, domestic fees. This award has no cash value.

7.3 Teaching Assistantships

Teaching Assistantship application forms can be found on the Department's web-site under Information for Graduate Students, Forms and Handbooks) (http://web.chem-eng.utoronto.ca/index.php?option=content&task=view&id=128&Itemid=114. Please read the Department Hiring Policy before applying for a Teaching Assistant position. Forms should be submitted to Julie Mendonça, Room 201C by the appropriate deadline.

Students are required to take the Safety Workshop (CHE 2222H), given by the Department during the first week of the Fall term, and pass the associated examination to be eligible for Teaching Assistantships.

Because of the limited amount of T.A. work available in the Department, each student is allowed approximately 100 hours within the Department for the academic session (September to

April). Thus, students who want extra T.A. work may consult other Departments and Faculties. Teaching assistantship positions will be limited, *within the Department*, to two years for M.A.Sc. students and four years for students in the Ph.D. program.

All students in a research program (M.A.Sc./Ph.D.) are guaranteed 40 hours of TA funding as part of their financial support. In order to receive this portion of support, students must apply for a TA position and notify the Coordinator of Graduate Studies as soon as they know that they won't receive one for that year.

For assistance with Teaching Assistantship matters, please contact Julie Mendonça in Room 201C.

7.4 Social Insurance Number

All students require a Social Insurance Number (S.I.N.) in order to receive financial support (stipend or teaching assistantship) from the University. In addition, a S.I.N. is required for all applications for Ontario Graduate Scholarships and NSERC scholarships. S.I.N. application forms can be found at http://www1.servicecanada.gc.ca/asp/gateway.asp?hr=/en/cs/sin/0300/0300_000.shtml&hs=sxn#f1. Please see Julie Mendonça, Room 201C, prior to applying for your S.I.N. so she can provide you with an employment letter. Human Resources Development Canada (HRDC) will not accept your application without this letter.

7.5 Payroll

Payment of graduate students for research and teaching is arranged by Julie Mendonça, in Room 201C.

7.6 Personal Expense Reimbursements

Arlene Fillatre and Leticia Gutierrez in Room 217 are responsible for personal expense reimbursements. To receive reimbursements, students must complete an EXPENSE REIMBURSEMENT FORM available in Room 217. This form must be signed by the student and the student's supervisor and returned to Arlene or Leticia. Original receipts for every transaction must be stapled to the form. Please note: Transaction Records (for Visa, M/C or Debit Card purchases) **are not "receipts"**. An official receipt lists the goods or services provided and indicates tax implications. This is very important to the University as all purchases are "class-coded" within the accounting system. We pay a reduced amount of GST. Transaction records do not show this information; they merely indicate that an amount was paid.

If you are taking the street car or subway and expect reimbursement, either purchase your tickets at a subway station from a collector (they can issue you a receipt), or obtain and keep a transfer (that will provide proof of payment). When traveling by air, you must keep your boarding passes and submit them as proof of travel. Most airline and/or train tickets are now arranged via e-mail, and your e-mail confirmation must also be submitted. Anything you receive that substantiates the purchase must be attached as proof of payment and travel.

More detailed information on travel expense reimbursement can be found on the Department's website, http://www.chem-eng.utoronto.ca. Look under Services/Resources - Financial/Admin Services. There you will find links to the required form and the travel expense reimbursement instructions.

8. LIBRARIES

8.1 University Libraries

There are numerous libraries on campus. The two main libraries for engineering references are the Engineering Library, located on the second floor of the Sandford Fleming Building, and the Science and Medicine Library in the Sigmund Samuel Library. Tours of the latter are organized regularly. Other major sources of references are the Departmental libraries in Chemistry, Physics, and Mathematics from which books and journals can be borrowed. To use these facilities, students must first get a T-Card from the Robarts Library.

8.2 Student Theses and Photocopier

In Room 215A, there are copies of theses written by Departmental students at the B.A.Sc., M.A.Sc., and Ph.D. levels, as well as M.Eng. project reports. These are available for students to peruse in Room 215A.

A photocopier is also available in Room 215A for students who wish to copy materials. A cash copy card, which may be purchased in Room 16 or obtained from your supervisor, is needed to use this copier. There is also a copier in Room 16 for students to use (with the cash copy card).

9. COUNSELLING AND LEARNING SKILLS

The Counselling and Learning Skills Service (CALSS) works with students at the University of Toronto. They provide personal counselling, stress management, performance anxiety programs, and learning skills in an atmosphere which is person-centred.

This service is confidential and free to students. It is funded through the Office of Student Affairs. They are located at the Mall of the Koffler Student Services Centre, 214 College Street, telephone 978-7970. Office hours are Mondays to Fridays, 9:00 a.m. to 5:00 p.m.

10. SPECIAL SERVICES TO PERSONS WITH A DISABILITY

These services aim to help students with disabilities and/or serious health concerns to participate in university life. Students first meet with a counsellor who may then refer them to

one of the professions on staff (e.g., Adaptive Equipment Consultant, Learning Disability Specialist, Occupational Therapist). All discussions are confidential and information is transmitted only with the student's permission. For further details please see the SGS Calendar entry under General Information.

11. THE CHEMICAL ENGINEERING GRADUATE STUDENTS ASSOCIATION (CEGSA)

11.1 CEGSA

CEGSA is the Chemical Engineering Graduate Student Association. Graduate students in this Department are elected to the executive of CEGSA and take part in helping to organize a wide variety of social events for the graduate student body, the professors and the staff. These events encourage a greater sense of community within the department and contribute to the graduate student experience. CEGSA also serves as a liaison between the graduate student body and the Department. It represents the graduate students at the Graduate Students Union (a university-wide association), Faculty Council, and the Teaching Assistants Union (Local 3902 of CUPE).

The Graduate Common Room (Room 247) is for the use of all graduate students. In, or right outside, it you will find daily newspapers, magazines, comfortable furniture, mail boxes, announcements, vending machines, a coffee machine, a television, microwave ovens, and many other graduate students. You will not find an ashtray, as this is a non-smoking Room. Access is granted through your Student T-Card. Please see Dan Tomchyshyn (Room 260) so that he can assign access to your T-Card.

CEGSA receives about $10 per student from your incidental fees, and this, combined with the revenue from the vending machines, generates income for the Association. CEGSA tries to spend the money in the best interest of the graduate students in the Department, (i.e., events, magazines, baseball team, etc.) but without everyone's input this cannot be ensured. Please make use of the Common Room and the services CEGSA provides. If you have any suggestions or ideas, the Association would love to hear from you. Volunteer your time.

The following graduate students make up the 2006-2007 CEGSA executive. They were all elected to these positions in September 2006. New elections for 2007-2008 will take place in September 2007. You can be a member of the executive by simply volunteering for one of these positions. Information about the elections (time, place, sign-up sheet) will be advertised around the department ahead of time.

For up-to-date information, visit CEGSA's website at http://cegsa.chem-eng.utoronto.ca/.

CEGSA Executive Members 2006-2007

Name	CEGSA Position	Room
Angela Tran Victor Castellino	Co-Chairs	259 361
Alex Hayes	Secretary	358
Tamas Fixler	Treasurer	259
Stephanie Hu Jaganathan Sam Roshdi	Assistant Treasurers	 226 223
Flor Garcia Jaganathan Aditya Ganti Neda Felorzabihi Chris Healy	Business Operations Managers	358 226 226 LM 34A 226
Chris Goode Zoe Coull Jana Dengler Hannah Guo Heidi Au Yunan Zhou L. Karina Lorenzo Olive Yao Li Arti Bhakta	Social Directors	358 226 327 226 327 358 333 333 108
Aditya Ganti	Web Master	226
Allie Simmonds Nicholas Wood	Sports Directors	311 319
Rafael Santos Emily Chiang	Health and Safety Representatives	349 232
Neda Felorzabihi Nilima Gandhi Victor Castellino	Graduate Studies Representatives	LM 34A 361
Daniel Saturnino	GSU Representative	314
Ghazal Azimi	Graduate Appeals Representative	223
Arafat Aloqaily	CUPE Representative	255B
Zoe Coull Angela Tran Sukrit Ganguly Arafat Aloqaily Maygan McGuire Arti Bhakta	Leaders of Tomorrow Graduate Organizing Committee	226 259 259 255B 122 108

Chris Goode	358
Kelly Sabaliauskas	122

11.2 Social Events

CEGSA hosts many social events during the year for all students and staff in the department. Traditional events include a welcome party in September, a Christmas lunch in December, and a Departmental picnic during the summer. CEGSA also provides a weekly coffee break on Friday afternoons, a great chance to meet with fellow students. Other events such as a Halloween party, multicultural events like the Chinese and Persian new-year lunches, and an outing to Skule Nite in March round out CEGSA's busy social schedule.

Sports play a large role in CEGSA's entertainment package each year. There are annual trips to baseball and basketball games. Teams have been entered by CEGSA in the past in the following leagues: GSU Volleyball in the fall and spring, Department of Athletics and Recreation (DAR) indoor soccer in the spring, DAR indoor softball in the spring, International Student's Centre (ISC) soccer during the summer, and DAR softball in the summer. In addition to these organized leagues, CEGSA has also run a number of department tournaments: golf in the summer, and bowling, pool, and curling in the fall and winter.

12. GRADUATE COURSE DESCRIPTIONS

The following are the general descriptions of graduate courses offered by the Department. Content may vary depending on the specific needs or wishes of students. Courses are not offered every year, and students are thus advised to contact the professor directly to ascertain when a course will be given. If there is insufficient demand, a course will not be offered.

Courses are divided into the following groups: Category A, Category B, 500-level courses and Engineering Management courses. Category A represents a first level of graduate courses suitable for a student who has graduated from a standard chemical engineering undergraduate program (or its equivalent). M.A.Sc. students take at least one course from this subset. Courses listed under Category B are second level graduate courses, typically of interest to a more limited number of students, providing more advanced coverage (beyond category A) or covering a more specialized area within chemical engineering and applied chemistry. The 500-level courses are challenging undergraduate courses which graduate students may take for credit. M.A.Sc. students may take one such course (at most) for credit towards the degree program, while Ph.D. students would not normally be given credit towards the degree for a course in the 500-level category. Occupational Hygiene courses have been discontinued.

The meaning of the letter designations following the course numbers is as follows: F = half course given in the Fall term; S = half course given in the Spring term; F,S = half course given in either the Fall or Spring term (check with the instructor); H = half course given over the Fall and Spring terms; Y = full course given over the Fall and Spring terms. Courses with an asterisk are offered every other year.

CATEGORY A COURSES

CHE 1107F - Applied Mathematics

Review of basic modelling leading to algebraic and ordinary differential equations. Models leading to partial differential equations. Vector analysis. Transport equations. Solution of equations by: Separation of variables, Laplace Transformation, Green's Functions, Method of Characteristics, Similarity Transformation, others time permitting. Practical illustrations and exercises applied to fluid mechanics, heat and mass transfer, reactor engineering, environmental problems and biomedical systems. Lecture notes provided.

JTC 1135S - Applied Surface Chemistry

The objective of this course is to introduce various modern surface analytical methods and to see how they relate to practical problems in science and engineering where consideration of surface properties and interactions are necessary. Emphasis will be placed upon the techniques themselves, the types of information they provide and how they relate and complement one another. While specific examples of applications of these techniques to various disciplines will be provided throughout the course, students will be able to review specific applications in the areas of their choosing. Areas may include microelectronic materials, metallurgy/corrosion, catalysis, biomaterials and polymer surfaces.

CHE 1140F - Topics in Process Identification and Control

Process identification (building models of dynamical systems based on observed data) and process control (making the output of a system behave in a desired fashion by properly selecting the process input) are mainstays in the process industries for improving productivity and quality. Since the use of such techniques is pervasive throughout all industrial sectors, they are an important part of any process control engineer's toolkit. To equip the student with these tools, this course will provide a blend of important theoretical concepts and practical implementation issues by examining current industrial practice. The main objective of the course is the development of the student's ability to identify process dynamics efficiently, formulate the control objective, select the appropriate control technique, and assess closed-loop controller performance. Students will be evaluated primarily using assignments in which they will have the opportunity to work with 'real' processes in a pilot-plant setting or simulations provided by industry.

CHE 1141S - Advanced Chemical Reaction Engineering

This second-level course in reactor design and analysis focuses upon the following topics: multiphase kinetics and catalysis; simultaneous diffusion and reaction, including an analysis using effectiveness factors and Thiele modulus; analysis of models of complex flow and mixing in reactors; reactor modelling; reactor performance and stability of operation for simple and complex kinetic schemes; design considerations for heterogeneous reactors; industrial and research applications of chemical reactors.

CHE 1142H - Applied Chemical Thermodynamics

This course has the objective of reviewing the basic concepts of thermodynamics with specific applications to processes involving phase equilibrium or equilibrium in chemical reactions. The course is divided in three parts. In the first part we will review the laws of thermodynamics, and the thermodynamic properties and phase behavior of pure substances. In the second part we will review the thermodynamic properties in mixtures and multiphase equilibria in non-reactive systems. In the last part of the course we will review the energy balance and equilibrium in chemical reactions. The evaluation will consist of a midterm at the end of the review section, and a final exam that will evaluate the last two parts of the course. This course also involves a term project where the student uses some of these concepts in a specific example related to his/her thesis project.

CHE 1143F,S - Transport Phenomena

Momentum, heat and mass transfer. General balances: continuity, species continuity, energy, and linear momentum equations. Rate expressions: Newton's law of viscosity, Fourier's law of conduction, and Fick's law of diffusion. Applications to multi-dimensional problems, convective transport, transport in turbulent flow, interphase transport, boundary layer theory. Discussion of transport analogies.

CHE 1147F,S - Data Mining in Engineering

An exceptional ability to deal with data is the defining characteristic of an engineer. Data Mining is the branch of Informatics that refers to a wide variety of methods used to obtain information from data. It employs statistics where possible but dares to tackle problems beyond the capabilities of statistics. Data containing experimental error, qualitative as well as quantitative data and large quantities of data are all subjects suited to Data Mining methods. These methods have traditionally been used in non-engineering fields. However, there is now an acute need to apply them in engineering. Students will use commercially available software applied to engineering data of interest to them. Data can originate from research projects, from the Internet or even from computer simulations. 70% of the course mark is assignments and presentations. 30% is the final exam. An undergraduate course in statistics is a prerequisite.

CHE1149S - Electrolyte Thermodynamics

Thermodynamics of electrolyte solutions including ionic equilibrium, activity models, complexation, speciation, and solubility. Computer-aided modelling of complex multicomponent electrolyte systems. Construction of speciation, solubility, and electrochemical stability diagrams in both dilute and concentrated solutions. Methods of extrapolation to elevated temperatures. Applications to inorganic processing, environmental, nuclear, pulp and paper, bioprocess engineering. Students engage in computational projects relating to their Thesis projects.

CHE 1310F,S - Chemical Properties of Polymers

Kinetics of polymerization and the conformation properties of the isolated random-coiling macromolecule. [Mechanism of chain propagation and step growth polymerizations using radical and ionic techniques.] The statistical thermodynamics of polymer solutions, derived (following Flory) for the dilute and for the concentrated solution. Applications to osmotic phenomena deduced from light scattering of polymer solutions. Extension of thermodynamic analysis to the theory of the intrinsic viscosity of polymer solution. Particular emphasis on the characterization of polymers. Introduction to the theories of de Gennes.

CHE 2504F,S - Industrial Pollution Prevention

A brief review of treatment technologies for air, surface and ground water, soils and solid wastes, and an account of more advanced technologies. Description of methods of analysing and monitoring contaminants and assessing their dispersal in local environments. Compliance with environmental regulations. Selected examples of "pollution prevention" approaches to process change to avoid environmental problems.

JCI 1503F - Advanced Topics in Computing and Information Systems

This course deals with timely topics in Information Technology (IT) practices and real life situations and cases of industrial use of Information Technology; computer security, disaster planning and recovery; capacity planning; strategic use of IT as a competitive weapon; end user computing and its implications to the corporation; automated programming methods, CASE, OOPs, etc.; customer service; data communications network opportunities; electronic data interchange; computer crime and viruses, and many others. Prerequisite MIE 1502H.

CATEGORY B COURSES

CHE 1118F,S - Industrial Catalysis/M.J.Phillips

The course covers adsorption, the nature of the catalyst surface, kinetics of catalytic reactions, catalyst selection and preparation, deactivation and poisoning, and specific catalytic reactions. The types of reactions and the examples considered will depend to some extent on the particular interests of those selecting the course but will include, in any case, nitrogen fixation, Cl chemistry, catalysis in petroleum refining (cracking, reforming, alkylation, hydrorefining, etc.), and catalysis by transition metal complexes.

CHE 1134H* - Advances in Bioengineering

This course, designed for graduate students whose research is at the interface of Engineering and Biology, will explore recent advances in the areas of bioprocess engineering, environmental microbiology and biotechnology, biomedical engineering, bioinformatics and other related topics. Each week, students will be required to prepare a critical review of assigned high impact journal articles. Discussion of the scientific, technological, environmental, economic, legal, and ethical impacts of the research will follow.

CHE 1213S* - Corrosion

The following topics amongst others, are treated: the various types and forms of corrosion, electrochemical theories of corrosion, corrosion testing methods, corrosion behaviour of iron, steel, and other common engineering metals, corrosion of steel and aluminum in reinforced concrete, passivity, atmospheric corrosion, underground corrosion, seawater corrosion, effects of stress, corrosion in the chemical process industries, the use of Pourbaix diagrams and methods of corrosion protection and control (selection of materials, coatings, corrosion inhibitors, cathodic protection, anodic protection). A number of problems (with worked solutions) are provided to clarify the concepts.

CHE 1314S - The Structure and Properties of Fibrous Materials

This course will focus on the structure and mechanical properties of short fibre reinforced polymers and paper. The relevant structural variables will include fibre parameters such as length, strength, and modulus, and composite/sheet parameters such as fibre dispersion and orientation. Analytical and numerical methods of describing the structure will be dealt with in detail. The discussion of the properties will begin with the classical shear lag model of Cox and will involve calculation of modulus, tensile strength, and fracture toughness. A roughly equal proportion of time will be spent on examples dealing with paper and short fibre reinforced polymers, although most of the underlying theory is valid for both types of materials.

JCI 1321H - Wood Engineering

Design of wood products, mechanical properties of wood, fracture mechanics of wood products, adhesion and joining of wood and other materials, wood machining.

JTC 1020F,S - Ceramics

The processing and properties of ceramic materials are considered in terms of the underlying principles of physics and chemistry. Topics may include glass, powder processing, sintering, and physical, mechanical, magnetic, optical and electrical properties. Applications of these materials in the forms of monolithic structures, fibres, composites, and coatings will be examined, with emphasis on performance as structural and wear resistant components.

JTC 1331F* - Biomaterials Science

An introduction to the various sciences underlying the use of materials in medicine (i.e., biomaterials) with particular emphasis on the interface between biological media and synthetic tissues. Instructors come from a variety of Graduate Departments and Institutes including Chemical Engineering and Applied Chemistry, Metallurgy and Materials Science, Biomedical Engineering, Dentistry and Pathology. Additional lectures may be provided by individuals from other Universities (e.g., McMaster University). Topics to be covered include: surface physics and analysis, principles of protein adsorption and cell growth on materials, structure and function of key tissues (bone, blood, etc.), principles of tissue responses to biomaterial implantation (toxicity, foreign body reaction).

Prerequisite: physical science/engineering background with some knowledge of materials science of biomaterials.

JCC 1313F* - Environmental Microbiology

This course is designed for students with little or no background in biology. A brief introduction to the composition of living matter, structure of organisms and life characteristics is followed by a survey of classification methods. In particular, plant, animal and protista of sanitary significance are characterized and discussed in detail. This is followed by the ecological aspects of sanitary microbiology.

JCB 1349F* - Molecular Assemblies: Structure/Function/Properties

This course will focus on the mechanisms associated with the assembly of the molecular and biomolecular systems, including colloids, small molecule organic crystals, and protein complexes. The goal of the course is to foster an understanding of the subtle interactions that influence the process of assembly, which has wide ranging implications in fields ranging from materials science to structural biology. Examples will be drawn from the current literature encompassing studies of self-assembly in solution at surfaces, and into the solid state. Supplementary reading and a term project targeting some aspect of molecular assembly will be assigned.

CHE 1400F,S - Environmental Nuclear Science

This introductory level course provides students with an understanding of the behaviour of radioactive materials in the environment and their impact on human health. The use of nuclear techniques to measure or eliminate pollutants is also described. The topics covered include nuclear stability and radioactive decay rates, natural sources of radiation, health effects of radiation, government regulations, external and internal exposure limits, derivation of maximum permissible concentrations in air and drinking water, biogeochemical cycles/pathways for radionuclides, instrumentation, nuclear methods for environmental analysis, destruction of pollutants using radiation, impact of nuclear facilities including reactor accidents and nuclear waste disposal.

CHE 1533F,S - Nuclear Chemical Engineering

Chemical processes within the nuclear fuel cycle, with an emphasis on the Canadian nuclear industry: uranium milling/refining, production of fission products and transuranic nuclides with the resulting change in reactivity, reprocessing of irradiated fuel and nuclear waste disposal.

CHE 1541F,S - Two-Phase Flow and Heat Transfer

This course covers the following topics: introduction to two-phase flow, basic definitions, flow regime, void fraction and pressure drop, homogeneous and two-fluid modelling, pool and flow boiling heat transfer, critical heat flux, rewetting and post dryout heat transfer, countercurrent flow limitation and some selected problems encountered in various industries.

JNC 2503S - Environmental Pathways

The objective of this course is to convey an appreciation of the sources, behaviour, fate and effects of selected toxic compounds which may be present in the environment. Emphasis is on organic compounds, including hydrocarbons, halogenated hydrocarbons and pesticides. The approach will be to examine, for each compound, physical and chemical properties, sources, uses, mechanisms of release into the environment, major environmental pathways and fates (including atmospheric dispersion and deposition), movement in aquatic systems (including volatilization, incorporation into sediments, biodegradation, photolysis, sorption), movement in soils, and bioconcentration. Toxicology and analytical methodology will be described very briefly. Each student will undertake a detailed individual study of a specific toxic compound.

CHE 1180H - Advanced Topics in Chemical Engineering

This course will offer the opportunity to provide instruction to graduate students on selected topics that are new and emerging in the chemical engineering discipline and that are not presently offered at the University of Toronto. The specific subject(s) covered will be determined by the instructor with approval of the Coordinator of Graduate Studies. The course will not likely be offered every year.

500-LEVEL COURSES

CHE507S - Process Modelling and Simulation

This course will teach students how to build mathematical models of dynamic systems and how to use these models for simulation and control purposes. The course will deal with both physical modelling (using the laws of nature to develop a model for the system) and identification (using observations from the system to fit a model to the system), with greater emphasis placed on the latter. Both continuous time and discrete time representations will be treated along with deterministic and stochastic models. This course will make extensive use of interactive learning by having students apply computer based tools available in the Matlab software package (e.g. the System Identification Toolbox).

CHE 553F* - Electrochemistry

This course has been designed to provide the student with a working knowledge of the subject area. The topics dealt with include, among others, the physical chemistry of electrolyte solutions, ion transport in solution, ionic conductivity, electrode equilibrium, reference electrodes, electrode kinetics, heat effects in cells, electrochemical energy conversion (fuel cells and secondary batteries), and industrial electrochemical processes. Numerous problems (with worked solutions) are provided to clarify the concepts.

CHE 564S - Pulp and Paper Processes

The processes of pulping, bleaching and papermaking are used to illustrate and integrate chemical engineering principles. Chemical reactions, phase changes and heat, mass and momentum transfer are discussed. Processes are examined on four scales: molecular, diffusional, unit operations, and mill. Students will assess the impact of driving forces and resistances on unit capacity and the determinants of product quality from operating units. In the tutorial, each student will work in a small team, make several brief presentations on selected topics and entertain discussion. There will also be a tour of a local paper mill.

CHE 565H - Aqueous Process Engineering

Application of aqueous chemical processing to mineral, environmental and industrial engineering. The course involves an introduction to the theory of electrolyte solutions, mineral-water interfaces, dissolution and crystallization processes, metal ion separations, and electrochemical processes in aqueous reactive systems. Applications and practice of (1) metal recovery from primary (i.e., ores) and secondary (i.e., recycled) sources by hydrometallurgical means; (2) treatment of aqueous waste streams for environmental protection; and (3) production of high-value-added inorganic materials.

CHE 568H - Nuclear Engineering

Fundamental and applied aspects of nuclear engineering. The structure of the nucleus; nuclear stability and radioactive decay; the interaction of radiation with matter including radiological health hazards; the interaction of neutrons including cross-sections, flux, moderation, fission, neutron diffusion and criticality. Poison buildup and their effects on criticality. Nuclear engineering of reactors, reactor accidents, and safety issues.

CHE 575H - Mechanical Properties of Bio-Composites and Biomaterials

This course provides an overview on mechanical properties of biological materials, biomaterials for biomedical applications, and bio-fibre reinforced composites based on renewable resources with a focus on their viscoelastic and dynamic behaviours. General principles related to elasticity, linear viscoelasticity, and composite reinforcement theory will be introduced. Some testing and measurement techniques for these properties will be also discussed.

SEMINAR COURSES

CHE 1211H - Pulp and Paper Seminars (CR/NCR)

A series of weekly, one-hour seminars on a wide range of topics concerning science and engineering related to manufacture of pulp and paper products. Students are required to present a seminar on their own research and attend the other seminars in the series.

CHE 2011H - Graduate Student Seminars

This will be a series of weekly, one-hour seminars on a wide range of topics concerning science and engineering as it relates to the students' research topics. Students are required to present a seminar on their own research and attend the other seminars in the series.

CHE 3000Y - Seminar Series in Chemical Engineering & Applied Chemistry

This course exposes graduate students to the latest developments in a wide range of topics in Chemical Engineering and Applied Chemistry. Students are provided with a breadth of understanding of the current trends in the many fields which fall under the umbrella of Chemical Engineering and Applied Chemistry. The course is comprised of a set of approximately 15 seminars given by internationally renowned experts. This course is mandatory for all M.A.Sc. and Ph.D. students and is to be taken annually.

ENGINEERING MANAGEMENT COURSES

M.Eng. students may take a maximum of 3 courses for credit towards the degree from the following list:

APS 1005 - Operations Research

This course introduces optimization techniques applicable in solving various engineering programs. These techniques are widely used in engineering design, optimal control, production planning, reliability engineering, and operations management. The contents of this course can be classified into two major categories: modeling techniques and Optimization algorithms. Topics include linear programming, sensitivity analysis, nonlinear programming, dynamic programming, decision making under uncertainty, new developments in optimization techniques.

This course is awaiting final approval. Please check the Mechanical and Industrial Engineering website (http://www.mie.utoronto.ca/grad/GradCourse/index.html) for details.

APS 1001 - Project Management

Project management has evolved from being an accidental job title into being a chosen profession with a career path, codes of ethics and its own body of knowledge. This intensive course will cover various aspects of project management including scope, cost, time, quality, procurement, risk, human resources, and, communications management. Both theory and practical application will be covered. Students will examine several project management case studies as part of the course. The course project will be undertaken working in teams.

APS 1002 - Financial Engineering

This course will focus on capital budgeting, financial optimization, and project evaluation models and their solution techniques. In particular, linear, non-linear, and integer programming models and their solutions techniques will be studied. The course will give engineering students a background in modern capital budgeting and financial techniques that are relevant in practical engineering and commercial settings. Students should take the operations research course first.

APS 1004 - Industrial Relations

This course analyzes the relationship between management and workers. The course takes a holistic and strategic view of how industrial relations affect the business environment. Students will study industrial relations from the context of economics, sociology, and psychology. Students will develop a historical appreciation and perspective of the evolution and development of labour relations through concepts presented by figures such as Adam Smith, Fredrick Taylor, Charles Deming, and J.M. Juran. The goal of the course is to provide a general manager with a thorough understanding of how they can develop a competitive advantage for their organization through effective and thoughtful human resource management practices. In the context of how they relate to industrial relations, the course topics include: organizational behavior including methods of motivation, scientific management, quality control, employment and economics, employment as a social relation, unions and other forms of employee representation, internal labour markets, strategic planning and the formulation of HR strategy, practices and policies.

OTHER COURSES

Students may elect to take courses from other Departments and Institutes such as the Departments of Civil, Electrical, Industrial, and Mechanical Engineering, Metallurgy and Materials Science, Chemistry, Physics, Mathematics, Statistics, Institute for Aerospace Studies, and the Institute for Environmental Studies where such courses are considered relevant to the area of study. In particular, the Department wishes to draw your attention to the following courses from the Department of Statistics:

STA 1004 - Introduction to Experimental Design

The most important contribution of statistics to scientific research has been the theory of experimental design. When planning an experiment, one wants to be sure that any conclusions drawn will be valid and unambiguous, and that experimentation will be efficient, yielding as much information as possible per unit of effort. An understanding of the principle of randomization, and the techniques of blocking and factorial design, is important to anyone doing experimental research. They were first developed by Sir R. A. Fisher for agricultural experiments, but are now applied in all areas, from Aerospace to Zoology; and from very applied industrial to the purest university research.

Topics to be covered include: randomization, blocking, one-way and two-way analysis of variance, Latin squares, factorial and fractional factional experiments, unbalanced designed, response surface methodology.

Prerequisite: A course in Linear Regression at the level of STA 302H.

This course is designed for: graduate students in Statistics and **in other disciplines where experimental design is important**, senior undergraduate students in Statistics and Actuarial Science.

STA 1005 - Applied Multivariate Analysis

The course is designed for all people who wish to learn how to analyze multivariate statistical data. Students will be encouraged to bring their own data. The basic emphasis will be on methodology and its applications, keeping the theoretical level to a bare minimum. Matrix notation will be used and some familiarity with it will be useful; a brief review will be given. There will be a great use of the statistical computing packages on campus (BMDP, SPSS). There will be two lectures a week and a third hour for analyzing statistical data.

The following topics will be covered: T^2 tests, tests of means, simultaneous confidence bounds, profile analysis; multivariate analysis of variance, C.R.D., R.C.B., Latin square designs, regression and analysis of covariance; growth curve models, the fitting of polynomials to correlated data; correlation, partial correlation, multiple correlation (R) and canonical correlation analysis; data reduction, principal component analysis; and discriminant analysis.

This course is designed for: Anyone interested in analyzing data. Students from different disciplines such as Education, **Engineering**, Forestry, Economics, Medicine, Geography, Anthropology, Agriculture, etc., are encouraged. At least one basic course in statistics, something of the level of STA 242Y or STA 262Y is required.

Scientific Writing Course/Staff

This high-end one-semester course is for professional development and is not for credit towards a degree program. It is designed to provide students with the skills they need to write a proficient thesis or research paper. It emphasizes creating a coherent framework and, at the sentence level, articulating concepts precisely. Grammatical and stylistic points are taught using examples from the professional literature. Each supervisor will be asked to provide a short bibliography of key papers and to suggest a topic for an oral presentation. Weekly assignments based on this material will be meticulously corrected. The course is intended for highly motivated students, either those at the advanced level wishing to hone their skills or those who demonstrate reasonable proficiency. A diagnostic test will be administered during the organizational meeting. The course meets for three hours once a week and requires approximately three hours of additional work.

The course is offered each term. A limited number of spaces may be available for students enrolled in departments other than the Department of Chemical Engineering and Applied Chemistry. Please direct enquiries to graduate@chem-eng.utoronto.ca

13. GENERAL INFORMATION

Much of the information you will need while a graduate student here is listed in the School of Graduate Studies (SGS) Calendar which is given to all students when they register. As well as lists of graduate courses offered by this and other Departments, the Calendar contains an Academic Calendar, showing important deadline dates, and information about degree regulations, fees, University of Toronto Fellowships, and various University services. In addition, the SGS Calendar outlines policies relating to the rights and responsibilities of graduate students at the University of Toronto.

Information about courses, seminars, scholarships, job opportunities, and much more, is posted on the bulletin boards outside the graduate office, Room 212. Some information may be sent to you through the mail (Room 247), but communication will be mainly by e-mail. There is also a weekly Departmental Newsletter, the Chem Eng News, which contains information of interest to graduate students (and other members of the Department). Copies of Chem Eng News may be picked up from the shelf of the mailbox in Room 247.

It is important that you observe deadline dates, so please keep informed by reading the bulletin boards frequently, checking your mail box every day, and reading the SGS calendar.

13.1 Change of Address

Changes to your address and/or telephone number must be made via ROSI. In addition, you need to notify the Graduate Office in writing. You also need to inform Julie Mendonça (Room 201C) who has a University of Toronto Staff change form which is needed to change your address for your Teaching Assistant's pay information. This also ensures that other information sent to you as an employee of the University of Toronto will reach you.

To obtain and maintain full-time student status (which affects your tax credits) you need to have an address which is close enough to the university to allow you to participate fully in university activities.

It is important that part-time students provide the Graduate Office with a telephone number and e-mail address where they can be reached during business hours. Anyone who has made his/her way to the Wallberg Building during a snow storm only to discover that the lecture has been cancelled will appreciate the reason behind this request. Information on closures during severe weather can be obtained by calling 416-978-SNOW (7669).

13.2 E-mail Addresses

All students are provided with a default utoronto.ca e-mail address on registration and have access to e-mail through the University server. This service is free. The University uses UTOR mail as the primary contact e-mail address for official correspondence.

Students should ensure that Pauline Martini in Room 212 has their e-mail addresses by e-mailing her at martini@chem-eng.utoronto.ca. Much valuable information is forwarded to students via e-mail.

UTOR i.d. information is available at http://utorid.utoronto.ca.

13.3 Purchasing

Students should discuss purchases for research with their supervisors. A purchase requisition form must be completed and signed by your supervisor. The purchase requisition form consists of two pages. The second page is a sales tax exemption certificate. It must be completed and signed by your supervisor if the equipment or supplies are being used 100% for research purposes. If the exemption form is not signed, both taxes will be paid on the purchase, regardless of where it comes from. There is a pre-conceived notion that items purchased outside of Ontario are not subject to provincial sales tax. This is not true and as a reputable organization, we are obligated to pay all taxes on goods used in Ontario.

If companies require a purchase order number, the requisition is processed by Terry Bunting (Room 16) if the total value of the purchase is under $5,000. Arlene Fillatre or Leticia Gutierrez in Room 217 will process purchase orders over $5,000 in value. All orders over $5,000 must have an official U. of T. purchase order processed and should have at least two competitive quotations. For purchases over $25,000, you must obtain three competitive quotations. If you need clarification of what is required, please see Arlene Fillatre in Room 217.

In those rare instances when difficulties arise with ordering supplies, Terry Bunting is available to assist you. A number of orders are placed with regular suppliers on a frequent basis. For these orders, there is a blanket order system in place. Blanket orders cannot be used to purchase equipment, however. See Terry Bunting (Room 16) or Arlene Fillatre (Room 217) for information about blanket orders.

Information on purchasing and other financial matters can be found on the Department's web-site, http://www.chem-eng.utoronto.ca. Look under Services/Resources - Financial/Admin Services. There you will find the Department's Guide to Financial Procedures and links to the various forms required. Remember the Purchase Requisition form is in two parts - the actual requisition form and the PST exemption certificate.

13.4 Fax and Photocopy Services

To photocopy material for research purposes, you must get a photocopy cash card from your supervisor. Cards for personal copying may be obtained in Room 16 at a cost of $1.00 each. Value can then be added to the cards in $1.00 (loonies only) increments. Further information on cash cards can be obtained from Terry Bunting in Room 16.

There is a copier in Room 16 in the basement and one in Room 215 available for student use. Charges are 5¢ per page. The value is deducted from the cash card as each copy is made.

THE PHOTOCOPIER IN ROOM 218 IS FOR THE USE OF OFFICE STAFF ONLY.

The fax machine in Room 217 is for Departmental business only. You must make other arrangements to send personal faxes.

13.5 Faculty and Research Interests

E.J. Acosta: Complex fluids research; surfactant-based processes; formulation engineering.
D.G. Allen: Biochemical engineering and environmental engineering.
T.P. Bender: Solar cells, organic electronics, functional organic materials (polymers and small molecules), organic process chemistry, organic synthesis, polymer synthesis
Y-L. Cheng: Drug delivery, biomaterials.
W.R. Cluett: Process Control.
D.E. Cormack: Mathematical modelling; modelling of electrochemical processes; corrosion; Kraft recovery boiler fouling and cleaning.
L.L. Diosady: Food engineering.
E.A. Edwards: Environmental engineering. Biodegradation and bioremediation of aromatic hydrocarbons and chlorinated solvents.
G.J. Evans: Nuclear engineering, reactor safety; nuclear waste disposal; nuclear analytical techniques.
R.R. Farnood: Advanced water treatment technologies and applied mathematics.
R. Fulthorpe: Biodegradation of chlorinated organic compounds, study of microbial communities found in pulp and paper waste treatment systems, bioreactor community structure analysis using molecular methods.
C.Q. Jia: Environmental engineering and technologies; pollutant behaviour in environment.
M. Kawaji: Fluid mechanics, heat transfer, microgravity science, multi-phase flow.
D.W. Kirk: Electrochemical reaction engineering; environmental engineering.
M.T. Kortschot: Non-metallic engineering materials: polymer composites; paper physics; engineered wood products.

Y.A. Lawryshyn:
R. Mahadevan:
E.R. Master:
C.A. Mims: Heterogeneous catalysis and surface science. Hydrocarbon resource conversion chemistry, new catalytic and electro-catalytic materials.
R.C. Newman: Corrosion and protection of metals, stress corrosion cracking, nanoporous materials, sensors, coatings, membranes, nuclear power systems and waste management, oil and gas production and refining, pulp and paper.
M. Ojha: Hemodynamics and cardiovascular pathology.
V.G. Papangelakis: Hydrometallurgical engineering; applied electrolyte solution chemistry.
M.J. Phillips: Kinetics and mechanism of heterogeneous and homogeneous catalytic reactions.
M. Radisic: Tissue engineering, bioreactors, biophysical modulation of engineered tissues, patterned cell co-culture (2D and 3D), Modeling of transport processes relevant to tissue engineering.
D.W. Reeve: Pulp and paper engineering.
J.P. Santerre: Biomaterials, surface modifying macromolecules, biodegradation of polymers.
M. Sain: Nano-engineered fibres for advanced papermaking; Nano-biocomposites; Durability of Natural Fiber-Composites; Advanced Processes for Waste Water Toxicity Removal.
B.A. Saville: Biochemical and biomedical engineering; enzyme deactivation and mass transfer in immobilized enzyme systems.
M.V. Sefton: Tissue engineering and biomaterials.
M.S. Shoichet: Biomedical engineering; surface modified biopolymers; nerve cell regeneration.
H.N. Tran: Chemical recovery in the aldaline pulping process. Plugging and corrosion in kraft recovery boilers.
F. Wania: Environmental engineering.
N. Yan: Advanced wood composites; printing process/paper interactions; paper physics.
C.M. Yip: Molecular self-assembly at interfaces. Biomolecular complexes and elucidation of the mechanisms associated with their formation. Molecular solids, crystal engineering, and the organic solid-state. Interfacial engineering.
P.W. Zandstra: Cellular and tissue engineering, receptor-ligand dynamics, cell migration.

13.6 Photographs

Photographs of all new graduate students are required for the permanent record cards. Photographs will be taken September 10, 2007, outside the Graduate Common Room (Room 247) immediately after the meeting to welcome new graduate students (12:15 p.m.). A date and time for photographs for students joining the department in January, 2008, will be announced later.

13.7 English Language Counselling

Graduate students whose writing skills need improvement are encouraged to acquire basic skills through formal writing courses. There is a Scientific Writing course offered by this Department in each of the Fall and Winter terms. Please see the Graduate Course Descriptions for more information about this course. Other courses are also available through the International Student Centre (ISC), 33 St. George Street, the School of Graduate Studies Office of English Language and Writing Support (ELWS) (www.sgs.utoronto.ca/english), and the School of Continuing Studies, 158 St. George Street. Students are also directed to evening courses offered by their local school board.

Students may also wish to consult private counsellors on a fee for service basis (fee payable by the student). Information about some private counsellors is posted on the notice board outside the Graduate Office as it becomes available.

13.8 Rooms and Keys

Keys for your room and for the building can be obtained from the General Office, Room 217 (Gorette Silva). No deposit is required when you first obtain your keys. However, a non-refundable fee of $20 is charged for replacement of any lost key(s). ALL KEYS MUST BE RETURNED AT THE END OF YOUR STAY HERE. Department keys are issued to you for your use only. **For your own security and the security of other users of the building, you should NEVER lend your key(s) to anyone else**.

It is important that students' rooms and labs be kept clean and tidy. Unneeded equipment and glassware should be returned as soon as you have finished with them. Please note that it is against Departmental safety policy to cover the window in the door to your laboratory.

There are periodic inspections of rooms and research laboratories to ensure good housekeeping and safe conditions.

13.9 Personal Safety

Students should at all times take precautions to ensure their own personal safety and the protection of their property. Purses and wallets should not be left unattended. Building and room keys should not be loaned to others. **Exterior doors must not be propped open.**

Students should be familiar with the building and know where the first aid stations are and how to exit the building quickly in the event of an emergency. There are first aid boxes on each floor of the Wallberg Building (Room 3, Room 16, Room 102, Room 125, Room 203, Room 218, Room 303, Room 419). As well, they should observe the regulations listed in Section 4 of this handbook.

It is important that students know how to get help quickly in the event of an emergency. Some telephone numbers which you should know are:

University of Toronto Police Emergency	978-2222
Metro Police Emergency	911

Please note that 911 should only be called from a Bell payphone. If you are using a University phone, call 8-2222.

13.10 Recycling

We in the University, and especially in the Engineering faculty, must provide leadership in the drive to reduce, reuse and recycle. We have to demonstrate to the community at large a commitment to protect the environment and a willingness to start in our own backyard. Therefore, the following items **must not be placed in the regular garbage**:

corrugated boxes	glass
uncontaminated wood wastes	scrap metal.

Blue boxes and bins are conveniently placed around the building for the disposal of paper. Corrugated boxes should flattened (**no** need to remove metal clips/tape or labels). The flattened boxes can be left beside the blue boxes or placed in the hallways for the caretakers to remove. Glass, wood waste and scrap metal should be taken to Room 16 for disposal.

13.12 Miscellaneous

There is a mailbox in the general office, Room 217, for telephone messages and faxes for graduate students. Incoming faxes and messages will be kept in Room 217 for one day and will then be put in the mail slots located in Room 247.

The Department publishes a weekly newsletter, the CHEM ENG NEWS, each Friday. This is a real community publication which graduate students are encouraged to read to keep informed about what is happening in the Department. Much of the material, such as notices of scholarship competitions, job opportunities, conferences, important deadline dates, announcements of upcoming orals, Departmental social events, directly affects graduate students. The CHEM ENG NEWS is sent via e-mail to all members of the Department. In order to ensure that you receive CHEM ENG NEWS, you must be sure to register your e-mail address with the Graduate Office (Room 212).

Employment opportunities are posted on a bulletin board outside the general office, Room 217. Some job opportunities are also posted on the bulletin board opposite the Graduate Office.

There is a separate bulletin board outside Room 217 for information concerning the Graduate Assistants' Association and Teaching Assistantships.

The Departmental Directory is revised in mid-September. It will be posted on the department’s web-site early in the fall term. New graduate students should let Gorette Silva

(Room 217) know their room number (and Building, if not the Wallberg). Current graduate students should also notify Mrs. Silva of any change of location.

Lists of courses offered by other Departments will be posted as received on the bulletin board outside Room 212.

This building is air conditioned for the comfort of all. PLEASE DO NOT OPEN THE WINDOWS!

APPENDIX 1

INSTRUCTIONS FOR COURSE ENROLMENT ON THE STUDENT WEB SERVICE (SWS) 2007 - 2008

Graduate students in the Department of Chemical Engineering and Applied Chemistry (CHE) are able to access the student web service to change personal information (addresses and telephone numbers), view their academic record and current courses, and to enrol in, request, or drop courses.

General Information

Student Responsibility

While academic advisors, faculty and staff are available to assist and advise**, it is the student's responsibility to keep personal and academic information up to date at all times and to follow all University, SGS, departmental and program regulations, requirements and deadlines**. The student web service makes it easier for students to check and correct this information. If questions arise about requirements, policies and procedures, students are responsible for seeking answers for these questions from staff and advisors.

Note: CHE and other university offices may send important information to you by email. Please make sure that your email address, your mailing/permanent address and telephone number are up to date at all times. Under University policy, students are required to maintain a University-based e-mail account (e.g., UTOR, ECF, CHASS, OISE), record that is entered in ROSI and check regularly for messages. That account may be forwarded to another personal account but it is the University account to which the University will send official correspondence. New students are advised to validate their UTORID at the University Library early. The UTORID provides access not only to the @utoronto.ca email account but also the University's student portal and learning management system. Many courses use the portal to provide online materials, discussion groups, quizzes etc. It is also used by the University and various student groups to make important announcements and administer elections.

Declaration

Use of the SWS to enrol in courses means that you agree to abide by all of the academic and non-academic rules and regulations of the University, the School of Graduate Studies and department in which you are registered and assume the obligation to pay academic and incidental fees according to the policies and requirements of the University of Toronto. You normally use the SWS to add or cancel courses. If, for extraordinary reasons, you are unable to use the SWS contact your department office as soon as possible.

Users of the Student Web Service are expected to be responsible when using the SWS and should not attempt to flood the system with requests, or to automate the process of course enrolment. Such activity may clog the system so that other students may be denied access or experience degraded

performance. Any student(s) attempting such activity may be denied access to the SWS until after the relevant registration period.

Personal Identification Number

Each time a student accesses ROSI via the web a personal identification is required in addition to a student number. The first time the system is accessed this will be derived from the student's date of birth (format YYYYMMDD). However, at that point the student will be required to change the PIN. Subsequent access to the system will require this new number which should be known only to the student. The PIN and student number together constitute an "electronic signature". ***Never give your PIN or student number to someone else.***

Forgotten PIN numbers can be reset by the graduate office. To avoid having to contact the office in person or having to wait for office hours, students can enter answers to a set of questions on the SWS. When they first access the ROSI, the SWS will prompt students to choose three questions from a list. If at a later date the student forgets the PIN, the PIN can be reset online if two of the three questions are answered correctly.

Services Available

Change PIN number
View/Change address, telephone number, email
View final grades
View academic history
Add/request/drop courses
View current courses or course request and waitlist status
View student account information
Order transcripts
Order graduation tickets
View transaction log

Updating Personal Information

Students may view or update their address, telephone number or email address through the Student Web Service. When entering new information, the "add" option should be used. "Change" should only be used to correct information in an otherwise correct record (e.g. typos).

Requesting Courses

Students may begin requesting courses on September 4. *Thesis and research activity are preloaded to students' records in the M.A.Sc. and Ph.D. programs. All course requests (including requests for courses outside the department)* ***must be approved*** *by the CHE graduate coordinator and supervisor. Students must request their courses by no later than September 28 in order to meet the SGS deadline of October 5 for adding courses to ROSI. Courses will be approved or refused before the last date to add courses. If you plan to take courses from another Department, you should check to see if the signature of that Department's Coordinator*

of Graduate Studies is needed. Students should check the web for their request status before October 1.

The web service requires full information about a course when a request is being made. Please consult the attached lists from your department. Be sure to enter:

Course number: e.g. HIS2651Y
Section Code: usually F, S or Y. This indicates whether the course is offered in the fall session (F), the winter session or second term (S) or over both (Y).
Teaching Method: all graduate courses have a teaching method of LEC (lecture).
Teaching Section: the number of the class. Most graduate courses only have one teaching session (0101). Although there may be only one teaching section the information must still be entered on the system.

NB. Some courses may require instructor's approval *in addition to that given by the co-ordinator/academic advisor*.

Courses from outside the department

Not all graduate departments allow students to enrol in courses via the web. Before attempting to add a course outside your department check with your department and the host department about procedures.

Waiting Lists

Not all courses or meeting sections have waiting lists. If the department offering the course has opted to allow a waitlist and either your enrolment category in the course or the course itself is full you can choose to join a waiting list. If a space is opened in your category then ROSI will automatically place you in the course. *It is your responsibility to check the SWS to check on your status as you will not be contacted by phone or email.* The SWS will inform you of your place on the waiting list and how many spaces are allotted for your category. You may "wait" in multiple meeting sections but if you are enrolled in one meeting section you may not simultaneously wait for another. Your unit may set a limit on the number of waitlisted course in your requests. Two days before the final date to enrol in courses all waiting lists will be suspended and normal enrolment procedures will apply. Consult your own unit to find out if you are permitted to join waiting lists. Consult the unit offering the course to see if a waiting list is being used.

Checking course status

Students are responsible for knowing the status of their course requests at all times. This information can be obtained via the web service. The following are the possible statuses:

REQ: Course requested. Must be resolved/approved by the last date to add a course.
INT: Course requested pending instructor approval in addition to co-ordinator's/advisor's approval.

APP: Request approved. Student is enrolled in course.
REF: Request denied. Student is not enrolled and may not make another request for this course via the web during this session.
CAN: Course cancelled (student withdrew from course before deadline)
WAIT: No Room in the meeting section. Student has been placed on a waiting list based on category and will be enrolled automatically if space comes available.
DWAIT: Student has cancelled place on the waiting list or been removed.

Cancelling or withdrawing from courses

Students may cancel or withdraw from individual courses using the web service up to certain deadline dates. Before doing this however, students are advised to consult with their advisor or departmental office.

Deadline dates:

August 31 Recommended payment or deferral date. Fees should be paid at a chartered bank by this date to allow for funds transfer in time for the September 14 registration deadline. Students not registered by the deadline will have their eligibility and courses cancelled and will not be permitted further access to enrol by the SWS.

September 4 First date students may request courses for the September 2007 and January 2008 sessions

September 14: Last date for students to submit enrolment forms or Program Change Forms for approval by department of fall and full year courses (F, Y sections).

October 5: Last date to add fall and full year courses on ROSI. Students will not be considered enrolled unless they have a course status of "APP".

October 26: Last date for students to submit Program Change Forms for departmental approval to cancel (i.e., withdraw from) fall courses (F section).

November 2: Last date to 'cancel' (i.e. withdraw) from a fall (F) course.

January 11: Last date for students to submit Program Change/enrolment forms to department for approval to add/enrol in winter session/second term (S) courses.

January 18: Last date for students to request winter session/second term (S) courses. Courses requiring approval must be cleared with the department before this date.

February 22: Last date to submit Program Change forms to department for approval to ‘cancel’ (i.e, withdraw from) winter session/second term (S) courses.

February 29: Last date to 'cancel' (i.e. withdraw) from a full year (Y) or winter session/second term course.

Final Results

Final grades in courses can be accessed through “Transcripts and Academic History”. Grades can be viewed after the following dates. If a grade is not available, contact your instructor or the graduate unit offering the course.

2007 Summer Session (first term)	August 2
(full summer and second term)	September 26
2007 Fall Session	January 23
2008 Winter Session (and Fall/Winter courses)	May 21

URL

The Student Web Service (a.k.a. ROSI's Page) can be accessed at www.rosi.utoronto.ca. Instructions are located there. Please remember to log out after each use.