THE UNIVERSITY OF IOWA
Department of Chemical and Biochemical Engineering

Department of Chemical and Biochemical Engineering

GRADUATE STUDENT HANDBOOK
(Updated Apr 2017)

Table of Contents

I. INTRODUCTION

The Chemical and Biochemical Engineering Department at the University of Iowa (UI) has a long and distinguished history in chemical engineering education and research. Chemical engineering has been taught at UI since 1905 and was accredited in 1926 (it was among the first 16 schools to receive accreditation). The department is accredited by ABET and is one of the best Biochemical Engineering Programs in the nation. The department has faculty with research interests in three major areas: polymerization, energy/environmental systems, and biological systems. All graduate degrees in Chemical and Biochemical Engineering are awarded by the Graduate College. Undergraduate degrees are awarded by the College of Engineering. The faculty has appointments in both colleges.

The department has multiple types of graduate programs, including a Ph.D. program, a 5 year combined undergraduate plus Master's program (called U2G for undergraduate to graduate), a non-thesis Master's program, and thesis Master's program. This document includes information on all of these types of graduate education.

This handbook is intended to inform graduate students of the policies, regulations, and procedures of the graduate program in Chemical and Biochemical Engineering. In addition, it provides guidance regarding the academic performance, research excellence and general standards of conduct expected of students pursuing a Master of Science or Doctor of Philosophy degree in this department. Since this handbook is concerned primarily with acquainting you with departmental regulations, the general regulations of the Graduate College are not repeated in this handbook. Graduate students are expected to independently familiarize themselves with all Graduate College regulations. If any of these policies, regulations, or procedures is found to be in conflict with those of the University or Graduate College, then those of the University or Graduate College will take precedence. Similarly, if any part of these policies, regulations, or procedures is found to be in conflict with Federal, State or municipal laws, or with the constitutions of the United States or the State of Iowa, then that part shall be automatically void.

The University of Iowa and the Department of Chemical and Biochemical Engineering admits, trains, and graduates students without regard to race, color, religion, age, disability, sex, associational preferences or national origin.

II. GRADUATE PROGRAMS AND DEGREES

The graduate program in the Department of Chemical and Biochemical Engineering provides qualified students with deeper and broader training than is possible at the B.S. level. Both the M.S. and Ph.D. programs are designed to equip the student with the skills to pursue a career in industry, academia, or government. All graduate students are expected to be competent in the core areas of chemical engineering. Students obtain more specialized knowledge and expertise through advanced course work in chemical engineering as well as in related disciplines. Excellence in research is expected of both Ph.D.

and M.S. thesis students. In collaboration with faculty members, students develop comprehensive plans of study based on their background and career objectives.

III. ADMISSION

A. Requirements and Procedures

Admission to the Department of Chemical and Biochemical Engineering is competitive and is based on an applicant's previous course work, research, and industrial experience. The general admission standards outlined below are intended to maintain the quality of the graduate program and to ensure sufficient preparation required for timely degree completion. Specific admission standards may be waived by the faculty when other evidence of competence is compelling. These standards are minimum standards, thus meeting these standards does not ensure admission to the program. Admitted students typically exceed these standards.

Applicants to the graduate program are expected to have a minimum cumulative grade point average of 3.00/4.00 with a B.S. degree in Chemical Engineering or a related science or engineering discipline.

Applicants are required to submit the results of the Graduate Record Examination (GRE). The GRE Advanced Examination in Engineering is not required for admission to the program; however, these scores should be forwarded to the department if the Advanced Examination is taken. The GRE requirement is waived for University of Iowa students in the College of Engineering applying for the undergraduate-to-graduate (U2G) program.

International applicants who do not speak English as their native language are required to submit the results of the TOEFL examination. Applicants who have completed a post-secondary degree at an English-speaking institution may request a waiver to this requirement. A minimum TOEFL score of 81 is required, though scores of competitive applicants are typically near 100.

Applicants must arrange to have three evaluation letters forwarded to the department through the admissions website. These evaluation forms should be completed by persons who are well acquainted with the applicant and their ability to undertake graduate work in chemical engineering.

Conditional admission to the M.S. program may be granted to students with demonstrated ability, but who do not meet the requirements for regular admission. For students admitted with conditional status, regular status must be attained within two academic terms. A conditional admission will carry a written statement of deficiencies and the specific actions required to remove the conditions. The student is responsible for taking the steps needed to remove the conditions.

While the department will consider applications at any time, first consideration is given to students who have their application folders (application material, GRE and TOEFL scores and the required letters of recommendation) completed by admission priority deadline as found on the application website.

The Director of Graduate Admissions (DGA) is responsible for overseeing the graduate recruiting activities and the graduate admissions procedures in the department. The DGA serves as the point of initial contact

between prospective graduate students and the department and maintains a file of each qualified applicant in the department office. The DGA, in consultation with the graduate admission committee and Department Executive Officer (DEO), screens the applicants and ultimately determines the applicants to be extended offers of admission.

B. Ph.D. Program

All students who are in the Ph.D. program in Chemical and Biochemical Engineering are required to pass the Ph.D. qualifying requirement and to provide evidence of superior ability to carry out independent research.

C. Applicants with B.S. Degrees not in Chemical Engineering

The department encourages students with degrees in other scientific disciplines, such as chemistry, biochemistry, biological engineering, engineering, environmental science, atmospheric science, materials science, mathematics, and physics, to apply for admission to the graduate program. Many such students have successfully completed both M.S. and Ph.D. degrees. However, these students are expected to attain a proficiency in specified core areas of chemical engineering equivalent to entering graduate students who hold a B.S. degree in chemical engineering. The background of each student admitted to the program with a degree not in chemical engineering will be reviewed by the faculty. The graduate faculty adviser (the Director of Graduate Studies) will specify in writing any remedial courses that will be required of the student. Examples of core undergraduate courses include:

Mathematics
- Calculus (MATH:1550, MATH:1560 or equivalent)
- Differential Equations (MATH:2560 MATH:3600 or equivalent)
- Matrix Algebra (MATH:2550, MATH:2700 or equivalent

Chemistry
- General (CHEM:1110, CHEM:1120, or equivalent)
- Organic (CHEM:2210, CHEM:2220, CHEM:2410 or equivalent)
- Advanced Sequence (Analytical Chemistry, Biochemistry, or Physical Chemistry)

Chemical Engineering
- Process Calculations (CBE:2105 or equivalent)
- Engineering Flow and Heat Exchange (CBE:3110 or equivalent)
- Fluid Flow (CBE:3109)
- Chemical Engineering Thermodynamics (CBE:3105 or equivalent)
- Mass Transfer and Separations (CBE:3115 or equivalent)
- Heat & Mass Transfer (CBE:3XXX)
- Separations (CBE:3XXX)
- Chemical Reaction Engineering (CBE:3120 or equivalent)

Approval of the Director of Graduate Study is required to grant credit toward graduate requirements, and is given on a case-by-case basis. Introductory undergraduate courses are not appropriate for meeting the graduate program requirements (see definitions).

IV. TERMS AND DEFINITIONS

Good standing – a student status as defined by the Manual of Rules and Regulations of the Graduate College. Standing with respect to the Graduate College is determined by GPA.

Probation – a student status as defined by the Manual of Rules and Regulations of the Graduate College. Students not in good standing with respect to the Graduate College are on probation.

Meeting expectations – a student status within the Chemical Engineering Department, achieved by students who simultaneously meet four criteria: "good standing" within the Graduate College, "satisfactory performance", "normal progress", and "appropriate professional conduct". The terms "satisfactory performance", "normal progress", and "appropriate professional conduct" are defined in the section on student evaluation.

Not meeting expectations – a student status within the Chemical Engineering Department, applied to any student failing to meet one or more criteria from the following list: "good standing" within the Graduate College, "satisfactory performance", "normal progress", and "appropriate professional conduct".

Core Course GPA – the average (on a 4 point scale) of grades in courses on the approved core course list, with the exception of Chemical Reaction Engineering CBE:3120. If multiple core courses are taken within a subject area or if courses are repeated, the Department faculty reserves the right to determine which courses are included in the average. Core courses not taken at the University of Iowa are typically not included in the GPA calculation, although they may be included at the discretion of the faculty.

GPA in approved graduate courses – the average (on a 4 point scale) of grades in courses used to satisfy the chemical engineering coursework requirement, excluding seminars and grades in independent research.

In residence - the student is making demands on departmental or University facilities and resources (i.e., using faculty time, office space, laboratory space, computer resources, shop facilities, etc.). "In residence" status is based on use of University resources and not on whether the student is living in the Iowa City area. Students working remotely or completing research off site can be in residence.

Full time registration – Nine semester hours in a regular semester constitute full-time registration.

Introductory undergraduate courses – Introductory undergraduate courses are not appropriate for graduate credit. Courses with numbering 052:0XX level (old pre-2013 numbering system) or CBE:0XXX, and CBE:1XXX (new numbering system) are defined as introductory undergraduate courses and are not appropriate for CBE graduate credit. Courses with numbering CBE:2XXX are typically not counted toward graduate credit but may be if faculty approval is granted. Technically relevant courses with numbering CBE:3XXX or higher that are not introductory and may count toward graduate credit.

V. ADVISING AND PROGRAM PLANNING

A. Faculty Advisor

The graduate student research supervisor also serves as the student's academic advisor. For non-thesis M.S. students, an academic advisor will be assigned by the Director of Graduate Studies. The faculty advisor evaluates the performance and progress of his/her advisees. The faculty advisor serves as a teacher and mentor to the graduate student. It is through this close sharing of responsibilities and common goals that the graduate student learns to become an independent investigator.

Initially, the Director of Graduate Studies will orient the student to the policies and procedures of the department and assist the student in adjusting to graduate student life. Within the first month or so of joining the program, new graduate students are required to discuss their research interests and objectives with each faculty member. At the end of this period, each student will inform the Director of Graduate Studies of his/her top three choices for their faculty advisor. Final assignment of the student to a faculty advisor is based on the mutual interests of the student and the faculty, current research commitments, and departmental obligations. The Department Executive Officer (DEO), in consultation with the faculty, is responsible for making the assignment of each graduate student's research advisor.

B. Examining Committee

In addition to the faculty advisor, each student has an examining committee. The examining committee assists the student in their graduate studies, evaluates his/her progress, administers examinations, and approves the M.S. thesis or Ph.D. dissertation. The Department employs thesis committees (also called dissertation committees) for M.S. thesis and Ph.D. students. Members of thesis committees are selected on a case-by-case basis and are specific to the student in question. An M.S. thesis committee normally consists of three members. A Ph.D. thesis committee normally has five members, one of which must be from outside the department.

The Department also uses a standing graduate examination committee, which consists of the Director of Graduate Studies, Director of Undergraduate Studies, and one or two additional members appointed by the DEO. The standing graduate examination committee is the examination committee for non-thesis M.S. students, and for students who have not yet formed their thesis committee.

The thesis committee plays an important role in advising the student in their graduate studies. It is therefore important that thesis committees be selected carefully. The graduate student and the faculty adviser together should identify committee members willing to serve on the committee and who meet Graduate College requirements. The names of these faculty members are forwarded to the DEO who then recommends the examining committee to the Dean of the Graduate College. The Dean of the Graduate College formally appoints the student committee.

C. Graduate College

The University of Iowa Graduate College is a partner with the CBE Department in the graduate educational process. The Graduate College is the degree granting body for all graduate degrees (not the CBE Department). The offices of Academic Affairs, Graduate Student Success, and Graduate Inclusion within

the Graduate College are important resources that should not be overlooked when it comes to planning and advising. The Graduate College, in conjunction with the Registrar, maintains extensive deadlines and Rules and Regulations for the completion and awarding of graduate degrees. Students with financial assistance or fellowships from the Graduate College may have reporting or other requirements specific to the Graduate College.

D. Peer Mentoring Program

The Department maintains a peer mentoring program for all new graduate students. Mentors are solicited from the 2nd year and more senior graduate students each summer, and paired with all new graduate students that have joined the program. The goal of the program is for each incoming graduate student to have a more senior graduate student (2nd, 3rd, or 4th year) that would contact the incoming student from time to time during the summer, and throughout the first year of classes. This program is entirely volunteer-driven. The objective is to improve the first year experience for incoming graduate students and help them integrate into the CBE department quickly and successfully. Some duties of mentors include:

- Initiate contact with your assigned new student(s) through e-mails messages.
- Contact your assigned student(s) at least once a week or once every other week to check in, answer questions, invite them to meet with you, etc. Many students have questions about transportation and housing that are best answered by peers (summer and fall semester)
- Contact your assigned student(s) as needed to offer support and check-in. (spring Semester)
- Offer to meet face-to-face to talk about the transition to graduate school.

Benefits of mentoring include:

- The opportunity to make a positive difference in the lives of new graduate students
- Develop your interpersonal skills, communication skills, and ethical standards
- Meet new people
- Provide service to your University and academic program; receive many thanks from your students, their families, and faculty.

E. Faculty Mentoring Program

The Department maintains a faculty mentoring program for all MS-thesis and Ph.D. graduate students. Students are paired with a mentor early in the first semester. Mentors provide a separate element of support for graduate students, beyond the research advisor. As a best practice, weekly meetings with your mentor are recommended for the first 10 weeks of the semester, followed by monthly meetings for the remainder of the first year. After the first year, meetings are recommended on an as needed basis.

Some roles that mentors are suitable for:

- Encourage students to go to conferences to present their research and network, discuss in general options for getting funding and how to pick the best meetings, how to prepare, and whether to present posters or oral presentations

- Share teaching strategies
- Tell students what you like about a career in academia
- Share personal career experiences, successes, failures
- Discuss political situations you encounter and how you manage the issue
- Understand that no two women and no two people of any race or ethnicity are the same
- Include students in social activities
- Discussing integration into lab & research
- Discussing integration into classes and community
- Teach them any unwritten rules that may exist in the Department, College, University or academic discipline

VI. REQUIREMENTS FOR DEGREE

A. General

All students are required to satisfy the general requirements of the Graduate College appropriate for the degree they expect to be awarded. In addition, all graduate students must submit an individual development plan (IDP) each academic year in residence to their faculty advisor and to the Director of Graduate Studies and must periodically report progress to the examining committee. Specific reporting procedures should be discussed with the faculty advisor and documented in writing. Students who do not give annual updates are subject to the withholding of research credit and/or reduction/termination of financial aid. Students who are not meeting departmental expectations are required to submit semester-by-semester IDPs to their advisor and examining committee.

To ensure basic competence in chemical engineering, all graduate students must take at least one course, from a departmentally approved list, within their first four semesters in each of the core chemical engineering branches of transport processes, chemical thermodynamics, chemical reaction kinetics, and technical communication. Approved courses include:

Transport Phenomena
CBE:5115 Transport Phenomena
Alternates approved on a case-by-case basis, and may include:
BME:5430 Biotransport
PHAR:7702 Transport Phenomenon
ME:5143 Computational Fluid & Thermal Engineering
Other courses approved on a case-by-case basis
Chemical Thermodynamics
CBE:5110 Intermediate Thermodynamics
Alternates approved on a case-by-case basis, and may include:
5000 / Thermal Physics Course
Other courses approved on a case-by-case basis
Chemical Reaction Kinetics

CBE:5315 Polymer Chemistry + Undergrad Chemical Reaction Engineering
CBE:5205 Introduction to Biochemical Eng + Undergrad Chemical Reaction Engineering
CBE:5425 Atmospheric Chemistry & Physics + Undergrad Chemical Reaction Engineering

Technical Communication

CBE:5104 Intro to Lit Review and Proposal Writing (for MS thesis and PhD)
CBE:5105 Intro to Lit Review and Technical Writing (for MS non-thesis)

All graduate students must also complete at least one course (3 sh, selected in consultation with the research advisor) in an area outside their own specialization area from the department's specialization areas – Polymeric Systems, Environmental Systems, and Biological Systems. Finally, all graduate students are required to be teaching assistants at least twice during their residency (except for non-thesis M.S. candidates) so that they can learn the skills needed to train and educate others, an important distinction between the undergraduate and graduate degrees. Other training courses such as safety courses, emergency preparedness, and sexual harassment prevention may be required. These requirements change from year to year, and students will be informed by Departmental staff or faculty of the appropriate requirements.

Credits that were earned more than 10 years prior to graduation (including transfer credits) are ineligible to count toward degree requirements, unless there is documentation as to how the knowledge and skills associated with those credits have been kept up to date through professional practice, continuing education, etc. The documentation should be prepared by the student, and approval by the CBE Director of Graduate Studies, and the Graduate College, is required.

B. Requirement in Ethics

All Ph.D. students and M.S. thesis students are required to enroll in and complete the College of Engineering one-semester seminar course "Engineering Ethics" (ENGR:7270) – to be taken during their first semester. All students (Ph.D. students, M.S. thesis, M.S. non-thesis, and U2G students) are required to complete the online scholarly integrity course: Collaborative Instructional Training Initiative (CITI).

C. Master of Science Degree

A minimum of 30 semester hours of graduate credit is required for the M.S. degree with thesis. Of these 30 semester hours, at least 24 semester hours must be in approved graduate-level course work and at least 6 semester hours must be in CBE:5999 M.S. Thesis Research. All M.S. candidates must demonstrate competence in research. M.S. students are required to have a graduate grade point average of 3.00/4.00 in order to graduate. In addition, the student must submit an acceptable M.S. thesis and pass the final examination. There is no foreign language requirement. Introductory undergraduate courses (see definitions) may not be used to satisfy the 24 semester hour requirement. One-semester-hour seminars such as CBE:5000 do not count toward the 24 semester hour requirement. Non-thesis M.S. candidates must satisfy the same requirements except the 6 semester hours of Thesis Research must be replaced with a cohesive course sequence approved by their academic advisor or the Director of Graduate Studies (DGS). Graduate students who receive assistantships, fellowships or other financial aid, which was awarded to them with the assumption that they pursue an advanced degree with thesis, are not eligible

to pursue the non-thesis M.S. degree. Non-thesis M.S. students will be required to complete the four core courses with a GPA for those courses exceeding 3.25.

Students on the Ph.D. track must obtain an *en-passant* non-thesis M.S. by fulfilling the following requirements: 1) completing the non-thesis M.S. course requirements (30 semester hours of coursework); 2) one manuscript for peer-reviewed publication approved by the research advisor, and 3) giving a departmental seminar.

Graduate students in the non-thesis M.S. option may petition for entry into the thesis M.S. program or the Ph.D. program by requesting a change of status through the Graduate College. The request will be reviewed by the Graduate Admissions Committee. If the Committee approves the request, then it will be forwarded to the faculty for final approval. Assignment to research advisors will be handled as if the student were a new graduate student.

D. Doctor of Philosophy Degree

The Ph.D. degree is granted primarily on the basis of achievement rather than on the accumulation of semester hours of credit. Excellence in research is the principal requirement for the Ph.D. degree. It is expected that the Ph.D. dissertation research represent an original and significant contribution to the body of knowledge in the field. Publication of at least one paper as first author, with the research advisor as a co-author, in a peer-reviewed journal, in addition to presentation of their research in a departmental seminar are requirements of graduation.

The Ph.D. candidate is normally expected to have completed three academic years of residence, or two years if he/she already holds a recognized M.S. degree. A minimum of 72 semester hours of approved graduate credit beyond the B.S. degree is required. Of the 72 semester hours, at least 30 semester hours must be in approved graduate-level course work. One-semester-hour seminars (such as CBE:5000) may not be used to meet the 30 s.h. coursework requirement, but may be used to meet the 72 s.h. overall graduation requirement. Introductory undergraduate courses (see definitions) may not be used to satisfy the 72 s.h. requirement. The Ph.D. student must have an overall minimum graduate grade point average of 3.25/4.00 in order to graduate. In addition, the student must pass the qualifying requirement, pass the comprehensive examination, submit an acceptable Ph.D. dissertation and pass the final examination. The Ph.D. candidate is reminded that these are minimum requirements. The faculty advisor and/or examining committee may impose in writing other requirements such as the completion of additional course work or the acquisition of specific skills. The actual amount of course work required is determined with the advice and consent of the faculty advisor. There is no foreign language requirement.

E. Examinations

1. Ph.D. Qualifying Requirement

All students on a Ph.D. track must pass the Ph.D. Qualifying Requirement within their first four semesters. The purpose of this qualifier is to determine the student's proficiency at graduate-level work. The requirement is satisfied if the GPA for the four core areas is 3.50 or better. Students who do not pass the Qualifying Requirement may petition to complete the Qualifying Requirement by an alternative method

acceptable to the research advisor, the Ph.D. examination committee, and the departmental graduate faculty.

2. Ph.D. Comprehensive Examination

The general rules for the administration of the Ph.D. comprehensive examination are contained in the policies and procedures of the Graduate College. The comprehensive examination consists of a written dissertation research proposal and an evaluation of research progress by the dissertation committee. The proposal must be presented orally and is open to the public. The proposal should contain the plan of study and some preliminary results. A guideline for the proposal format is given in the Appendix of this document. See the section on required timelines for completion of the comprehensive exam. The comprehensive examination may be reported as satisfactory, satisfactory with reservations or unsatisfactory. Two or more unsatisfactory votes constitute a failure. A satisfactory with reservations report will state in writing the concerns of the committee and the specific courses, procedures or other requirements to be satisfied by the student. The examining committee will also specify in writing the time by which these requirements must be satisfied by the student. The comprehensive examination may be repeated once at the discretion of the examining committee.

3. Final Examination

The general rules for the administration of the final examination are contained in the policies and procedures of the Graduate College. The final examination is administered by the candidate's committee and consists of an oral presentation by the candidate of their dissertation work. The final examination is a critical inquiry into the purpose, methods and results of the research and may include intensive examination in areas related to the investigation. Ph.D. and M.S. final examinations are open to the public. The final examination may be reported as satisfactory or unsatisfactory. Two or more unsatisfactory votes constitute a failure. The final examination may be repeated once at the discretion of the examining committee.

The final examination should be scheduled as early in the semester of graduation as possible in order to provide as much time to make the required corrections and additions to the thesis or dissertation that are required by the examining committee. In general, the final examination should be scheduled no later than two weeks before the final deposit deadline.

The final examination must be passed no later than five years after passing the comprehensive examination for Ph.D. students and no later than four years after entry into the graduate program with an external M.S. Failure to meet this deadline indicates that the student is failing to make appropriate progress in the program, which may lead to reduced financial aid or dismissal from the program. Please note that additional requirements for normal progress (which may be stricter than those above) are contained in the section "Student Evaluation" section of the handbook.

F. M.S. Thesis and Ph.D. Dissertation

The thesis or dissertation, complete and in final format, must be presented to the Graduate College for a check by the first deposit deadline (see the Graduate College Thesis Manual). After approval by the Graduate College and by the examining committee, the thesis or dissertation must be deposited before

the final deposit deadline. An abstract of the Ph.D. dissertation, not to exceed 350 words of text, is to be deposited with the dissertation. The abstract must be approved and signed by the dissertation advisor.

The Graduate College requires that the Ph.D. dissertation be made available to all members of the examining committee no later than two weeks before the date of the final examination. The department requires that the M.S. thesis be made available to all members of the examining committee no later than two weeks before the date of the final examination. In addition, the department requires that each student deposit two approved copies of the thesis or dissertation to the department properly hard bound, or with payment of the departmental binding fee. Students should also provide a soft bound copy of the approved thesis or dissertation to all members of the examining committee who request one. Photocopies of the thesis must be of high quality on 20-lb. weight paper. Photographs, micrographs and other graphics should be faithfully reproduced. Additional requirements are found on the Graduate College Website.

G. Seminar

All Ph.D. and M.S. thesis graduate students writing a thesis must enroll in Graduate Seminar (CBE:5000) every semester that they are in residence except summer. Students failing to attend seminar regularly will receive a failing grade for the course. All non-thesis M.S. students are required to enroll in Graduate Professional Development seminar (CBE:5100) in their final two semesters. The 1 s.h. from these seminars does not count toward the 30 semester-hour degree requirements of approved graduate coursework in Section V, but can count toward the 72 s.h. overall graduation requirement. Exceptions to this requirement of seminar attendance must be approved in writing by department faculty (i.e., at a faculty meeting) on a case-by-case basis.

H. Registration Requirements - Ph.D. Post Comprehensive and M.S. Finals

The Graduate College requires that students be registered in the final session in which the degree is awarded. In addition, Ph.D. candidates are required to be registered in each semester (summers excluded) after passing the comprehensive examination until the degree is awarded. See Section VIII.D for registration recommendations.

I. Department Graduation Checklist

After final deposit of the thesis or dissertation, the student must submit a completed Departmental Graduation Checklist to the department three days before the semester commencement exercises. Failure to submit a Graduation Checklist will result in a hold placed on your graduation records.

Graduation Checklist

Student to Department

- ☐ Deposit two copies of thesis or dissertation for binding and suitable bound copies for each committee member.
- ☐ Pay departmental binding fee, unless the copies are already properly hard bound (as indicated in the previous item).
- ☐ Return all keys to department administrator.
- ☐ Return all books and software to department library.

- Return all U.O. equipment to U.O. laboratory.
- Satisfy all financial debts to the department.
- Provide a forwarding address.

Student to Advisor and Laboratory

- Make arrangements with advisor to assure that all originals (or copies if approved by advisor) of log books, laboratory manuals, experimental data, computer codes, etc. are turned in to the faculty advisor.
- Submit an electronic copy of thesis to advisor.
- Return all books, journals, papers and other items borrowed from advisor, except as agreed between the advisor and student.
- Return all instrument operation manuals, safety instructions, procedures, and maintenance records to advisor.
- Return all supplies and equipment borrowed from other laboratories.
- Report all broken instruments.
- Report supplies that need to be ordered.
- Leave all research equipment and chemicals, which are not in continuing use, in condition for indefinite storage or immediate disposal.

Note: Graduating students are not permitted to take any University supplies, manuals, handbooks or other items from the laboratory, except with permission from the responsible faculty member.

VII. FINANCIAL ASSISTANCE

A. General

It is the policy of the department to provide financial aid, subject to available resources, to eligible students so that they may devote their full energy and attention to the research and coursework necessary for obtaining an education and completing the degree requirements. Although most financial aid is provided in the form of teaching and research assistantships where service to the University is required, the graduate student stipend is viewed primarily as financial aid rather than the remuneration for services rendered. In addition, the graduate assistantship provides an important educational opportunity for students to obtain experience in teaching and research. For this reason, all candidates for Ph.D. and M.S. with thesis are required to complete both teaching and research assistantships during the course of their graduate studies.

B. Sources of Support

The funds available for graduate assistantships are primarily through sponsored research contracts and grants obtained by faculty members. Other funds are provided to the department by the College of Engineering and the Graduate College. In general, there are no departmental funds for summer support. Therefore, summer support for students can only be provided from external funds. Consult your faculty advisor on matters regarding summer support.

C. Eligibility

As available funds permit, it is the policy of the department to provide or arrange financial assistance for each graduate student who is meeting departmental expectations. Non-thesis M.S. students are not provided financial aid.

The University requires all first-time teaching assistants whose first language is not English to be tested to assess their English speaking and comprehension skills and general suitability for teaching undergraduates before they are assigned assistantship responsibilities. All incoming graduate students are screened by the Director of Graduate Studies as to whether testing in English is required for certification of oral competency. Students who mark English as their first language on their application may be required to take testing. The tests are given each semester and summer session the week prior to registration by the Department of Linguistics. Students are given detailed information and instructions about the tests and are able to ask questions when they register to take the tests.

Full-time graduate students with outside employment are usually unable to devote the necessary time and effort to their research and course work. This results in unnecessary delays in completing the requirements for the degree, hurried or inferior research and an undistinguished thesis or dissertation. To ensure excellence in research, full-time graduate students appointed to positions of half-time or greater may not be employed outside the department, except through professional training programs approved in advance by the department. Students violating this provision will be ineligible for financial aid. Students who feel this provision causes unusual hardship may request an exception from the department. However, the nature and duration of the hardship must be fully documented and the student must be able to maintain "normal progress".

D. Duration of Eligibility

For students entering without previous graduate work, it is the policy of the department to continue support for up to five years for a Ph.D. student “meeting expectations” and two years for an M.S. with thesis student. For students entering with previous graduate work, the duration of support will be prorated (reduced) with respect to the student’s initial placement in the graduate program. It is to be emphasized that the uncertainty regarding the funding of graduate education by state and federal agencies makes it impossible to guarantee the level and duration of support for any student. Financial support during a sixth year in residence for a Ph.D. student (third year for M.S. student) meeting expectations may be arranged upon the recommendation of the student’s research advisor. Funding is subject to funds available after all other eligible students have been supported. Students who fail to maintain normal progress as defined in Section VIII.D will not be considered for sixth year (third year for M.S.) support. A Ph.D. student who has been supported for six years (or M.S. for three years) from sources provided or arranged by the department, or requiring departmental approval will not be further supported from such sources (including external research grants and contracts obtained by the research advisor). Exceptions to this policy will require a formal appeal by the student which must be approved by the faculty.

Students become ineligible for financial support from departmental funds 30 days after passing the final examination. Continued support for a time period up to the end of the semester may be provided by the faculty advisor through external research funds.

E. Assistantship Responsibilities

1. Research Assistantship Activities

Each student in the Ph.D. or M.S. with thesis graduate programs will participate in research activities of some type during each semester in residence except when the individual has been assigned an unusually demanding teaching assistantship. Research assistantship activities are intended to give the student direct and continuing experience in the actual research process from formulation of the study through collection and analysis of data and preparation of a scholarly paper. These activities are intended to facilitate the research progress and productivity of the faculty member and the research group with which the student is associated. The research performed under a research assistantship may or may not be related to the student's thesis work. Since thesis research activities are concerned with matters of originality, creativity and excellence, they are not subject to the hours per week guidelines of the general assistantship requirements.

2. Teaching Assistantship Activities

Each Ph.D. or "M.S. with thesis" graduate student in the department is expected to serve as a teaching assistant two different times during their graduate studies. Every effort is made to arrange T.A. assignments with due regard for other responsibilities the student may have. Since T.A. assignments directly affect the education of students, it is necessary that all duties be carried out in a timely and effective manner. Non-thesis M.S. students may serve as a Teaching Assistant if approved by the department.

3. Other Appointments and Assignments

Students funded from project grants carry out their research assistantship in support of that particular project, but must meet the teaching (or alternative) requirement, either during periods when not assigned to the project or through concurrent effort. Specific responsibilities are specified at the time of appointment.

F. Absences and Vacation

Unlike undergraduate students, Ph.D. or "M.S. with thesis" graduate students and faculty have research and/or teaching duties on a continuous basis including those periods when classes are not in session (e.g., winter and spring break). Graduate students receiving financial support must observe normal University business hours. At the very least, this means assistantship duties should be carried out during Monday through Friday, 9 a.m. to 5 p.m. Students must discuss the possibility of alternative working hours with the research director (R.A.) or the instructor (T.A.) in charge. The research director or instructor in charge should be notified of absences due to illness or family emergency as soon as possible. Graduate students should behave professionally, notifying colleagues and supervisors in advance of planned absences. Students absent for extended periods without approval will become ineligible for departmental financial aid. Graduate students may take paid leave or vacation as outlined by University guidelines. Current

guidelines allow two (2) weeks of paid leave for academic year appointments and three (3) weeks of paid leave for fiscal year appointments. Typically, such vacation should be taken between academic semesters and must be approved by the student's research advisor. Students cannot accumulate vacation from year to year (use it or lose it).

G. Assignment

The awarding of financial support is made by the department at the beginning of each semester. The department recognizes primarily two levels of assistantship activities— ¼-time and ½-time. One-half time assignments require about 20 hours per week and ¼-time about 10 hours per week. Specific assistantship assignments are made each semester. For teaching assistantships, the T.A. will be notified as early as possible, in writing, of the course(s), the instructor in charge, beginning and ending date of the teaching appointment and the duties to be carried out. For research assistantships involving research not related to the student's thesis work, the R.A. will be notified as early as possible, in writing, of the project(s), the research director, the beginning and ending date of the research appointment and the duties to be carried out. For research assistantships involving thesis work, the graduate student is supervised by his faculty advisor until the completion of all degree requirements.

In the assignment of financial support, due consideration is given to the interests and capabilities of the students. However, it is necessary to weigh this against the needs of the department and the requirements of the various funding agencies which support departmental research activities. The department makes assignments according to the following procedures:

The DEO presents a list of students eligible for financial support and a list of appointments available for faculty consideration.

Faculty members with external research support inform the DEO of the student(s) to be supported from their research grants.

The remaining students are assigned to department teaching and research activities. The faculty reviews the progress of these students based on their semester IDPs and determines the eligibility and priority of each student. The faculty considers the following when making this determination: progress toward the degree objective, past performance as a T.A. or R.A. and service to the department. Inadequate progress toward the degree or substandard performance on previous assignments will result in reduction or elimination of financial support. The student will not be eligible for support until he/she is able to perform at the required level of performance for one full semester.

In addition, preference is given to thesis students (a) with demonstrated excellence in research and/or academic performance, (b) those already receiving support, and (c) U.S. citizens and permanent residents.

H. Renewal and Termination

1. Renewals (Reappointments)

Appointments to assistantships or traineeships are for a fixed period, usually one academic year. Sometimes the appointment may be made for one semester or 11-12 months. Renewal of an appointment

for a subsequent period is based on the evaluation of the faculty advisor and the collective judgment of the faculty concerning the student progress and professional conduct. It is emphasized that all renewals are contingent on the continued availability of state, federal, and project funds for student support.

2. Termination During the Term of an Appointment

A graduate student on an assistantship or traineeship may be dismissed during the term of that appointment. Loss of student status triggers termination of the appointment. A graduate student may be dismissed from an assistantship or traineeship appointment during the term of the appointment, without necessarily losing student status, for 1) any reason sufficient to dismiss a faculty member during the term of an appointment (see University Operations Manual[1]), or 2) failure to follow or implement properly and adequately reasonable instructions of the supervisor when such instructions are within the proper scope of the supervisor.

I. Tax Status

The University is required by federal regulation to withhold income tax from money paid from University sources and from project grants. The University will provide an annual W-2 form showing the amount withheld. The tax status of these payments, in whole or in part, is subject to interpretation of the Internal Revenue Service Code. Each individual taxpayer bears the responsibility of filing an income tax report according to the individual's situation and applicable status.

J. Collective Bargaining Agreement

The terms and conditions of employment, including but not limited to wages and benefits, in this position are governed by a collective bargaining agreement between the Board of Regents, State of Iowa and UE Local 896/COGS, the union representing graduate teaching and research assistants at the University of Iowa. Copies of this collective bargaining agreement will be provided upon your appointment and may be viewed from the University web site: http://hr.uiowa.edu/bargaining/cogs.

K. Special Requirements

To comply with the Immigration Reform and Control Act of 1986, the department and the University must verify the citizenship status or employment authorization of all persons hired after November 6, 1986. Each student employed by the department must present documents that verify his/her identity and eligibility for employment. A departmental authority must physically examine the documents and verify their authenticity and that they relate to the individual to be employed. Both the student and the department must complete the appropriate sections of Form I-9.

The following documents may be used to establish both identity and eligibility for employment: U.S. passport, a Certificate of U.S. Citizenship, a Certificate of Naturalization, an unexpired foreign passport with attached Employment Authorization and an Alien Registration Card with photograph.

---

[1] See for example Section II Community Policies (chapters on sexual harassment, consensual relationships between instructors and students, violence, drug use, harassment, use of information technology resources, and research), as well as Section III Human Resource Policies (Standards and Ethics; Time Off and Scheduling).

The following documents may be used to establish identity only: State-issued driver's license or personal identifying information such as name, sex, date of birth, height, weight, and color of eyes, a U.S. Military Card, Native American tribal documents, a school identification card with a photograph, a voter card, and an identification card issued by a federal, state, or local government agency.

The following documents may be used to establish employment authorization only: social security card other than one not valid for employment purposes, an unexpired reentry permit, an employment authorization document issued by the Immigration and Naturalization Service, a birth certificate issued by a State, county or municipal authority bearing a seal or other certification and Native American tribal documents.

VIII. STUDENT EVALUATION

A. Review of Progress by the Faculty

Each fall, the Director of Graduate Studies will lead a faculty evaluation of progress of each student, and a determination of whether students are meeting departmental expectations. The faculty will base their decision on the academic record, the semester progress reports, and performance in carrying out the responsibilities of a research or teaching assistantship, evaluations from faculty members and an evaluation by the faculty advisor. In addition, the faculty will determine the level of financial support to be provided (continued, increased, reduced or eliminated), whether the student should be placed on or removed from probation, or in some cases, be terminated from the program. This evaluation will also document progress toward fulfilling the requirements of the degree objective. A student who disagrees with the evaluation may submit a letter stating the reasons why the student disagrees with the evaluation. This letter will be attached to the evaluation and will become a part of the student's file.

B. Individual Development Plans and Annual Meetings

All students shall report their research activities and document their progress toward their degree objective on a regular basis. For students "meeting expectations", annual reports are due by the Friday of the 6th week of the spring semester. For students not meetings expectations, a report is required during fall and spring semesters (by the Friday of the 6th week of the semester). These reports are to be submitted using the template provided by the Department. Advisors may add additional questions or sections to the Individual Development Plan (IDP). One copy is supplied to the advisor and one copy to the department administrator. Documentation and supporting material may also be required and will be considered part of the progress report. The progress reports will become a part of the student record maintained in the department office. Timely submission of the progress report is required for eligibility for financial aid.

All graduate students are required to meet annually with a faculty committee. Progress reports serve as part of the student record that is reviewed at annual committee meetings. Students not meeting expectations should have meetings each semester until good standing is reestablished. Two types of committees exist: (1) the standing graduate examination committee, which consists of the Director of Graduate Studies, Director of Undergraduate Studies, and up to two additional members appointed by

the Department Executive Officer (DEO); (2) the specific dissertation committee(s) formed by MS Thesis students (in their 2nd semester) and by Ph.D. students (in their third semester). Non-thesis M.S. students will meet with the standing examination committee. Thesis M.S. students should always meet with their dissertation committee due to the compressed nature of the M.S. thesis timeframe. Ph.D. students can meet with the standing examination committee in semesters 2 and 3, but should then meet with the dissertation committee thereafter. Meetings should be completed by the Friday of the 10th week of the semester. This applies to both spring and fall semesters. This is necessary to prevent end-of-semester scheduling conflicts and to allow committees to approve degrees where appropriate. Where scheduling conflicts prevent a meeting with a full dissertation committee, a meeting with a partial committee or with the standing examination committee is permitted, although a written report of the meeting should be circulated to all members of the dissertation committee. For example, participation of the external committee member is not expected on an annual basis. Separate annual meetings are not required in years with comprehensive examinations or thesis defense examinations.

C. Satisfactory Performance

Students are classified as "meeting expectations" or "not meeting expectations" based on the following criteria. See the Definitions and Terms IV for additional definitions.

1. M.S. Program

A cumulative graduate grade point average of at least 3.0. The department standard is higher than the 2.75 minimum required by the Graduate College.

Generally good performance in research productivity for M.S. thesis (based on the written evaluation of the faculty advisor and/or research director).

Generally good performance in teaching assistantship activities (based on the written evaluation of professor in charge).

Attendance of departmental seminars as described in the Requirements for Degree section (VI.G).

2. Ph.D. Program

A cumulative graduate grade point average of at least 3.25. The department standard is higher than the 3.0 minimum required by the Graduate College.

Generally good to excellent performance in research productivity (based on the written evaluation of the faculty advisor and/or research director).

Generally good to excellent performance in teaching assistantship activities (based on the written evaluation of the professor in charge).

Attendance of departmental seminars as described in the Requirements for Degree section (VI.G).

D. Normal Progress

The length of time required to complete a degree program will vary depending on a variety of considerations such as previous degree(s) awarded, background, conditional or regular admission, full or part-time status, degree objective and plan of study. The rate of progress normally expected is such that a resident full-time student would complete an M.S. program in one to three calendar years after the B.S. and the Ph.D. program in four to six calendar years after the B.S. Course selection and registration will be determined in consultation with the academic advisor and generally is as follows:

The guidelines for "normal progress" for each degree objective are listed below. For all graduate students, additional reporting and committee meeting guidelines in the Progress Reports and Annual Meetings section applies.

1. Minimum registration guidelines for all students

The Graduate College Manual has complete rules and regulations on registration requirements and CBE graduate students are governed by them. The Departmental guidelines below exceed those of the Graduate College. Advisor approval is required to deviate from the guidelines below. Registration requirements can be complex, as registration can affect financial aid packages, Fellowships, insurance eligibility, taxation status, immigration status, student loan deferment eligibility, and/or graduation requirements. Please contact department administrators and your advisor on guidance for appropriate registration.

Registration should accurately reflect student usage of faculty time, office space, laboratory space, shop facilities, etc.

All semesters

Both Ph.D. and M.S. students must be registered for at least 2 semester hours (research or coursework) in every fall and spring semester up until the semester of graduation. Registration for summer semester is not required unless the degree will be awarded during the summer or if the department deems registration is necessary.

All semesters in residence

Students must register for graduate seminars as described in Requirements for Degree section (VI.G).

Initial four semesters

All students must register for full time registration during regular semesters although 12 s.h. is recommended. No registration is required during the summer, although students with Fellowships may have special registration requirements. Furthermore, a degree cannot be granted during a semester (or during a summer) where the student is not registered appropriately.

Semesters 5 and beyond

Continuous registration and associated tuition payment is required during all regular semesters. However, students may, with the consultation of their advisor, register at between 2 s.h. and full time registration. Planning is required so that graduation requirements such as 72 s.h. of approved credit are met during the semester of anticipated graduation. Other constraints on registration as described above may apply. Filing of "short hours" forms are required, and International Students are required to submit forms to both immigration and registrar offices. If a student fails to register, then the student may not be readmitted to candidacy until the student has received the appropriate approval and submitted the necessary application.

Registration in "Doctoral Continuous Registration," "Masters Continuous Registration" are not necessary for CBE students who are activity working toward their degrees (instead use Ph.D. Research and Masters Research registration). For applicability of these and other continuing registration course numbers, please see your advisor and department administrator. "Doctoral Final Registration" and "Masters Final Registration" may be appropriate in special cases but are not needed for students who graduate in the semester of their thesis defense. Please see your advisor and department administrator.

2. M.S. Thesis Program

Semester 1

Before selecting a research advisor, the student is advised by the Director of Graduate Studies (DGS). With the advice and consent of the DGS, the student registers for coursework, seminar, and research. The student meets with potential permanent advisors. A permanent advisor is assigned. The student will usually perform a complete literature review, learn necessary methods and techniques, and perform preliminary experimental work. The student must submit a semester report to his/her research advisor.

Semester 2

Coursework, seminar, and research continues. Early in the second semester the student forms an appropriate thesis committee for the first time and presents a preliminary plan of study. The examining committee will modify and approve the plan of study. Research normally continues throughout the summer whether registered for summer classes or not.

Final Semesters

Depending on the progress made in course work and research, the student should complete the thesis and pass the final examination in the third to fourth semester of registration.

3. M.S. Non-Thesis Program (not combined degree program)

Semester 1

The student is advised by the Director of Graduate Studies (DGS). With the advice and consent of the DGS, the student registers for coursework. A plan of study listing the courses for all semesters anticipated prior to graduation should be created by the student, approved by the advisor, and filed in the student file. Graduate Professional Development Seminar is recommended but not required until the final two semesters.

Semester 2

Coursework continues and progress reports and examination committee meetings are held. Graduate Professional Development Seminar is recommended but not required until the final two semesters. Summer registration and/or summer research is not required for the non-thesis master's student, and securing of internships or external research opportunities is highly encouraged.

Prior to each semester, the non-thesis student should meet with the academic advisor. During the final two semesters, the Graduate Professional Development Seminar is required. Additional reporting is described in the Progress Reports and Annual Meetings section. Failure to complete an M.S. thesis degree within four semesters may constitute not meeting normal progress, depending on committee discretion. Failure to complete an M.S. thesis degree within six semesters constitutes not meeting normal progress.

4. Undergraduate-to-Graduate (U2G) Degree program

The undergraduate-to-graduate (U2G) program (formerly known as the BS/MS program) is described on the Department website. This section applies to both University of Iowa BS/MS students and to participants in dual institution BS/MS programs.

Semester BS6 (sixth semester of a traditional 8 semester B.S. degree, or junior spring)

Meet with academic advisor, completing a U2G plan (Iowa students only). Submit application to the graduate college (Iowa students only). For University of Iowa CBE students, GRE scores are not required. For all other students, GRE and letters of reference are required.

Semester BS7 (7th semester of a traditional 8 semester B.S. degree, or senior fall)

Begin to take up to 4 cross-credited classes (12 s.h.) for the BS and MS degrees. Attend the University of Iowa CBE graduate student orientation.

Semester BS8 (8th semester of a traditional 8 semester B.S. degree, or senior spring)

Continue taking up to 4 cross-credited classes (12 s.h.) for the BS and MS degrees. Complete degree requirements for the B.S. degree. Meet with the graduate examination for the first time.

Semester Grad 1 (1st semester of 2 semester graduate program)

Begin taking 6 or more graduate courses and fulfilling the graduate core. Maintain appropriate core and graduate GPA levels.

Semester Grad 2 (2nd semester of 2 semester graduate program, final semester)

Finish taking 6 or more graduate courses and fulfilling the graduate core. Maintain appropriate core and graduate GPA levels. Final meeting with graduate examination committee.

5. Ph.D. Program

The guidelines for "normal progress" for a Ph.D. student with a B.S. degree and having no transfer graduate credit are indicated below. The guidelines for students holding an M.S. degree in chemical engineering are also listed below, although a case-by-case determination is made for each student based on the level of experience and academic preparation.

Semester 1

Before selecting a research advisor, the student is advised by the Director of Graduate Studies (DGS). With the advice and consent of the DGS, each student registers for course work and research. The student meets with potential permanent advisors. After several weeks, a permanent advisor is assigned. The student will usually perform a complete literature review, learn necessary experimental methods and techniques, and perform preliminary experiments.

Semester 2

The student will continue taking required core courses and learning lab techniques. The Literature Review and Proposal course will assist the student in developing their dissertation research plan. In the spring of the first full year in residence (typically semester 2) students should meet with the standing graduate examination committee and present their progress update and plan of study.

Semester 3

In conjunction with the research advisor, the dissertation committee members should be selected and invited onto the committee.

Semesters 3-6

Semesters three through six are devoted to completing all core course requirements, the qualifier requirement, and preliminary research. The student will have completed the four core courses by this time and completed the Ph.D. qualifying requirement.

For students entering with an M.S. in chemical engineering, the qualifier requirement should be met during or before the 3rd semester. For students entering with a B.S. in chemical engineering, the qualifier requirement should be met during or before the 4th semester. For students entering with other degrees, the qualifier requirement should be met during or before the 5th semester.

For students entering with an M.S. in chemical engineering, the comprehensive requirement should be met during or before the 4th semester. For students entering with a B.S. in chemical engineering, the comprehensive requirement should be met during or before the 5th semester.

For students entering with other degrees, the comprehensive requirement should be met during or before the 6th semester.

Failure to meet these timelines may constitute failure to make normal progress.

Subsequent Semesters

After passing the comprehensive examination, the student intensifies the level of research and achieves a mastery of the subject area. The departmental requirement for a non-terminal MS degree should be met in the semester after the comprehensive is taken.

Final Semester

In the final semester, the student should meet all the requirements of the plan of study and the rules of the Graduate College. The student should meet all residency and dissertation requirements of the Graduate College and the department. The student must pass the Final examination.

IX. Additional Student Expectations

The following sections describe departmental expectations for graduate students in areas of scholarship, service, and teaching. These expectations may be reflected in annual evaluations and other elements of student feedback.

A. Appropriate Professional Conduct

As engineers we are expected to act in a responsible and professional manner and are expected to participate in departmental or other professional activities. Relevant standards include the course materials in Department, College and University ethics classes and trainings, departmental expectations of academic honesty (see academic misconduct section of this document), the Code of Student Life, University Operations Manual[2], and the Code of Ethics of the American Institute of Chemical Engineers (see Appendix). Alleged violations of this provision will be investigated by the department faculty. If a violation of professional conduct is substantiated, then the department faculty will determine any punitive or corrective action at a closed session of a departmental faculty meeting.

B. Scholarly Record Keeping

1. Laboratory Notebooks

Students must maintain laboratory notebooks, or equivalent records, using best practices appropriate to their discipline (e.g., as taught in the technical communication core course). Any laboratory-specific or advisor-specific record keeping norms or policies must be adhered to.

---

[2] See for example Section II Community Policies (chapters on sexual harassment, consensual relationships between instructors and students, violence, drug use, harassment, use of information technology resources, and research), as well as Section III Human Resource Policies (Standards and Ethics; Time Off and Scheduling).

Record keeping procedures should keep in mind the goals of notebooks: (a) prove what you did and when you did it, for intellectual property disputes, as well as misconduct investigations; (b) transmit information to coworkers, including after your graduation; (c) assist you in remembering your experiments and protocols for future experiments and publications; and (d) analyzing and troubleshooting problems.

Minimum requirements for paper notebooks are: (a) permanent binding (stitched or glued), (b) all entries in permanent ink, (c) all entries dated with the date of entry (not the date of the experiment); (d) identification, including name, contact information, and signature(s).

2. Electronic Research Notes

Electronic records of research (instrument output files, computer codes, analysis scripts, electronic lab notebook systems) should be maintained according to laboratory-specific record keeping norms, advisor recommendations, and grant/contract data management plans. Data management plans typically specify backup procedures and frequencies, file formats, quality assurance procedures, storage location and indexing procedures, and rules or restrictions for access.

3. Computers

Computers that store research data, publication files, University of Iowa email, etc. need to be managed appropriately, whether they are (a) maintained by the College or University, (b) owned and maintained by the laboratory group, or (c) personal computers such as laptops. Files and devices should be appropriately secured and backed up. The department encourages lab groups to develop group- and project-specific policies in conjunction with college and university IT staff.

C. General Participation and Service Requirements

Each Ph.D. or "M.S. with thesis" student meeting expectations, regardless of source of support, is required to participate regularly in the research, teaching, and services activities of the department as an integral part of their graduate training. As a rule, all graduate students are required to serve as examination proctors several times each semester. However, other responsibilities are taken into consideration in compiling the list of proctors. Students who are selected to serve as proctors will be notified electronically or by an announcement in their mailbox. Students may also be asked to grade papers and homework.

Graduate students will be asked occasionally to assist the department in hosting visitors (e.g., prospective students, industrial visitors, speakers, University leaders, funding agency program managers, advisory boards, etc.) and in holding special events (e.g., research symposia, open houses, outreach/education events, Departmental gatherings, and awards programs). Participation provides excellent opportunities for the students to develop skill in both formal and informal presentations.

D. Academic Misconduct

In dealing with issues of academic misconduct, the department follows the procedures as outlined in Manual of Rules and Regulations of the Graduate College, which can be found at http://www.grad.uiowa.edu/graduate-college-manual. For BS/MS courses that are for dual credit toward the BS and the MS degree, academic misconduct will be governed by College of Engineering rules and

regulations. All graduate students should review the appropriate sections of the Manual of Rules and Regulations of the Graduate College. In summary, plagiarism, cheating, and other forms of academic misconduct are defined by the CBE faculty in accordance with norms appropriate for U.S. engineering programs. Sanctions for academic misconduct are to be determined by the CBE faculty, and can range from an F in an assignment up to dismissal from the Department, which triggers simultaneous dismissal from the Graduate College. Appeal of decisions should use the Departmental grievance procedures described below. If the grievance cannot be settled at the Departmental level, an appeal should be made to the College of Engineering (BS/MS classes for dual credit) or to the Graduate College (all other classes).

The following policies applies to all courses, but may be superseded by specific information in each syllabus. Faculty are encouraged to specify sanctions for cheating and plagiarism in syllabi, but are not required to do so.

Exams: In cases of cheating on hourly or final exams, it is recommended that the instructor reduce the student's grade to the grade of "F" in the course. When a course grade has been reduced to an "F", the student may not drop the course. Second grade option is not permitted for any graduate courses, so the F will remain on the transcript. It is recommended that cheating on quizzes be considered as serious a violation as on exams and that the penalty be similar. The instructor shall send a written report of any disciplinary action to the Office of the Dean of the Graduate College and the report shall be placed in the student's file.

Plagiarism: For a first offense of plagiarism on reports and literature reviews worth 15% or less of the total course grade, a zero on the assignment and a written report of the disciplinary action to the Office of the Dean of the Graduate College and the student file is recommended. For a first offense of plagiarism on reports and literature reviews worth more than 15% of the total course grade, an F in the course and a written report of the disciplinary action to the Office of the Dean of the Graduate College and the student file is recommended. For any second offense of plagiarism, dismissal from the Department is recommended. The two offenses may be in different courses or different semesters.

Homework, Lab Reports, etc.: Each instructor shall announce and distribute in writing, at the beginning of each course, the acceptable policies on student collaboration in each of the graded course requirements. When the policy is clearly violated, a zero shall be assigned for the total portion of the course grade allocated to the requirement in which the violation occurred (e.g., a zero for all homework assignments if cheating occurred on a homework assignment). A written report of this action shall be sent by the instructor to the Office of the Dean of the Graduate College and placed in the student's file.

X. Additional Considerations Regarding Graduate Education

A. Additional Support Resources

Beyond the resources of the Department, College of Engineering, and the Graduate College, there are considerable support systems at the University of Iowa to assist students, especially in times of stress or

crisis. As of March 2017, a master list of resources was at: https://dos.uiowa.edu/assistance/quick-guide-for-helping-students/master-resource-list/. Key contact information is:

- Emergency 911, or 319-335-5022 (University of Iowa Public Safety)
- If you're not sure where to start, call Student Care and Assistance at the Office of the Dean of Students, 319-335-1162, DOS-Assistance@uiowa.edu
- The resources available as of 2017 included the Threat Assessment & Care Team, University Counseling Service, Student Health & Wellness, Sexual Misconduct Response Coordinator, Women's Resource and Action Center, Rape Victim Advocacy Program, Office of the Ombudsperson, Domestic Violence Intervention Program, Graduate College, Student Legal Services, International Student and Scholar Services, Student Disability Services, Office of Equal Opportunity and Diversity, Associate of Campus Ministers, Johnson County Crisis Center 24-hour Hotline, UI Health Care 24-hour Nurseline, and National Suicide Prevention 24-hour Lifeline. Consult a web search engine to find phone numbers and office locations. Many of these offer confidential and/or 24-hour support.

B. Changing Advisors

A change in advisor-student relationship may be requested by either the student or the faculty member. Changing this relationship, while possible, may create numerous difficulties for the student as well as for the advisor. The department may be unable to provide alternative financial support for students previously supported by their faculty advisor or unable to find another faculty member willing to act as their faculty advisor. In addition, the faculty member may be unable to fulfill his or her research obligations. As a result, changes in advisor are not taken lightly and cannot be automatically approved.

Should a difficulty arise in the advisor-student relationship which cannot be resolved privately, the Director of Graduate Studies and the DEO may be able to assist the parties in reaching a mutually acceptable agreement. If the problem cannot be resolved after consultation with the Director of Graduate Studies and the DEO, then a change of advisor may be formally requested by one or both parties. A change of advisor must be approved by the student, the student's advisor and the DEO. In the event that either the student or the former advisor refuses approval, a departmental faculty meeting will be held to discuss the change. The approval of the department faculty is required before the change of advisor is approved. In either case, the student can petition the department (by writing a letter to the DEO requesting to present their case at the departmental faculty meeting).

A change of advisor may be permitted only when the following conditions have been met:

- A change in advisor is in the best interests of the student, the faculty advisor and the department.
- The Department Executive Officer has been consulted.

The student is able to find a new faculty advisor in the department or has taken steps to transfer out of the department. Generally, a change of advisor will require the student to change research projects.

A change of advisor will not be permitted if an M.S. candidate has less than one full semester remaining in his program. A Ph.D. candidate must have at least three full semesters remaining before completing degree requirements.

The student and/or faculty advisor should submit his/her request for change of advisor, in writing, to the DEO, giving their reasons for making this request. The DEO will bring this request to the department faculty for their approval before the request is approved.

C. Intellectual Property

1. Academic Freedom

The freedom to express new and divergent ideas and to challenge existing "truths" is essential to the vitality of the University. Consistent with this principle, the department encourages students to propose new theories and techniques in the course of their research. Furthermore, students are encouraged to express their ideas in a responsible and scholarly fashion.

It is not an infringement of a student's academic freedom to have the purposes, methods, results and conclusions expressed in the thesis or dissertation challenged for their scholarly merit or to demand that they meet the scrutiny of intense examination and the generally accepted standards of the academic community. In addition, the acceptance of the thesis as meeting the requirements for the degree is solely the function of the examining committee and the Graduate College and academic freedom is not at issue during the final examination.

2. Copyright

University regulations state that the M.S. Thesis or Ph.D. Dissertation is the property of the student and may be copyrighted by the student. It should be noted that a copyright does not imply ownership of the ideas, theories, methods, or conclusions expressed in the thesis or dissertation by the author. Rather, a copyright merely protects the specific form of the expression (i.e., the document itself). The student has the right to copyright his/her thesis or dissertation and can do so by following the procedures established by the Graduate College.

Furthermore, although the written document is the intellectual property of the student, and while novel ideas, concepts, theories, methods, results, and conclusions may also be the student's property, it can also be the property of persons other than the student. In such cases, these ideas, concepts, theories, methods, results and conclusions are the intellectual property of the person(s) who first conceived of them. The student must comply with the requests and demands of the owner(s) of the intellectual property contained in their thesis or dissertation unless the intellectual property in question is available in publicly accessible publications. This provision is not intended to prevent the full publication of the thesis or dissertation.

3. Intellectual Property and Patent Rights

Except as provided for in the following paragraphs, textbooks and other products of teaching, research, scholarship, and artistic endeavors belong to the faculty or staff member (graduate student) when the product is not the result of a specific assignment or commission and where there is not substantial

University contribution or support beyond the salary, developmental assignment, services, and facilities (including libraries and laboratories) customarily provided to faculty (or graduate students) in the respective discipline and University unit.

The University has an interest in and reserves the right to review, negotiate, and sign agreements for the use or sale, outside the immediate instructional setting, of the following educational materials: (1) Materials specifically commissioned by the University; (2) Materials to which the University has made a substantial contribution (one which is significant in the context of the situation and the practices in particular disciplines, schools, departments, or other units of the University); and (3) Materials developed with the assistance of outside funding where terms of the grant or contract are binding on the author or the University.

Rights in inventions are administered by the University Patent Committee and the University of Iowa Research Foundation pursuant to the official University Patent Policy adopted by the Board of Regents and set forth in the University Operations Manual. Questions regarding these policies should be addressed to the Office of the Vice-President of Research.

D. Student Complaints Concerning Faculty Actions

Informal. Students with complaints against faculty must first attempt to resolve the issue with the faculty member against whom there is a complaint. Lacking a satisfactory outcome, the student should discuss the matter with the Director of Graduate Studies and/or DEO of the department.

Students who are uncomfortable with dealing directly with a faculty member or DEO may seek assistance from the Ombudsman in the College of Engineering in seeking a resolution of the complaint. However, it is anticipated that grievances can be satisfactorily resolved most expeditiously at the faculty or DEO. If the student is not satisfied with the outcome of this procedure, then the student should discuss the complaint with the Dean of the Graduate College.

As with all complaint procedures, all reasonable actions will be taken to prevent any retribution against the student(s) initiating the complaint, and any witnesses. This will include, if necessary, accelerated consideration of a change in academic advisor.

Formal. Students may submit a formal appeal to a faculty action by submitting a complaint in writing to the DEO. If the complaint is specifically related to the DEO, the complaint may be submitted to the Dean of the College of Engineering. The statement should clearly and completely state the allegation(s), including times, places, and individuals concerned, and must be signed and dated by the complainant. The information provided should form the basis for a thorough investigation of the allegation(s). The statement should also contain a preferred remedy. The recipient of the appeal (DEO or Dean) shall investigate and respond in writing within 10 working days. The recipient may in the course of their investigation and deliberation bring the matter before a faculty meeting, or they may form an inquiry committee of faculty and/or peers. However, these are not required. If the decision is rendered without consideration at a faculty meeting, the student may further appeal and require the decision to be reconsidered at a faculty meeting. Should this formal procedure fail to resolve the issue, the student is encouraged to contact the Graduate College or the University Ombudsperson where additional informal

and formal dispute resolution options may be available. Relevant policy sections include the Manual of Rules and Regulations of the Graduate College, as well as the Academic Grievance Procedure of the Graduate College.

XI. DEPARTMENTAL POLICIES

A. Smoking Policy

Smoking is prohibited in all University owned buildings, University owned or leased vehicles, and on all University grounds. This includes recreational facilities, athletic facilities, parking lots, and enclosed parking facilities.

B. Assignment of Office/Lab

Each semester the DEO will assign office and laboratory space to graduate students. Priority for office and laboratory space will be given to students performing thesis research, to teaching assistantships who must meet with students, and full time graduate students. Due to space limitations, office space cannot be guaranteed to all graduate students.

C. Keys and Departmental Security

Keys (or electronic access) to student offices, laboratories, common areas and entrances may be obtained from the department administrator. Students will only be issued keys for which they are specifically authorized. The keys must be returned when requested by the department or when the student no longer requires access. In any case, all keys issued to the student must be returned when all degree requirements are completed.

Each student and faculty member is responsible for all keys issued to him/her. The student must leave a deposit for each key, which will be reimbursed when the keys are returned.

Since departmental security depends on key control, it is necessary to re-key all affected locks and issue new keys when a key is lost, stolen or not returned. This is a very expensive process costing up to several hundred dollars for some locks. Do not lend your keys out or leave them unattended. Return keys you no longer need as soon as possible. Graduation applications, registration and other paperwork may be canceled for failure to pay outstanding bills to the department.

The theft of laboratory and personal items is common. Do not keep valuables in your desk. Keep your keys with you at all times. Lock your doors and windows when leaving your laboratory. Do not block open locked doors. Do not let unauthorized persons into the building after hours. Anyone who belongs in the building after hours should have a key.

D. Computing

As a graduate student in the department you also have access to all ECS (Engineering Computer Services) resources. Students must use computing resources ethically and legally. It is a violation of University policy to access, read, copy or use the computer programs, files, tapes or other material without the knowledge and consent of the owner. Violation of this policy is considered the equivalent of theft. In

addition, students must observe the copyright protection afforded commercial software and are not permitted to make illegal (or "bootleg") copies of copyrighted software. Access to super computers, parallel processors and other high speed computing resources is available. Your faculty advisor or the DEO can assist you in obtaining time on these machines.

E. Shops

There are a number of shops on campus available to repair and construct graduate research apparatus. These shops charge users for labor and materials. A university requisition is required and must be requested prior to obtaining services. Please work closely with your advisor to select facilities for construction and repair of apparatus.

F. Purchasing Supplies and Services

Purchasing procedures differ depending on where the item or service is being purchased from. Please check with the Departmental Administrator prior to purchasing goods, or services, including travel tickets, hotel reservations, and conference registrations.

Major equipment costing more than $5,000 should be submitted to University Shared Services for review and potential bids. This process can be time consuming and usually takes several months to complete. Students should plan their research accordingly.

For routine lab supply purchases, send an e-mail, quote, or eBuy cart to University Shared Services (uss-engineering@uiowa.edu or Shared Services for your lab). Make sure to include the vendor, item number, item name/description, price, and quantity. Shipping will be standard delivery unless you note a need for expedited delivery.

College of Engineering Shared Services Contacts https://uiowa.edu/university-shared-services/contacts/college_of_engineering

G. Library

The Engineering Library should be considered a valuable asset to graduate researchers. The Engineering library, and other libraries on campus have valuable short courses on searching literature and databases, citation and reference management, and data management. Researchers are encouraged to meet with the Engineering Library staff to discuss their research and discover relevant resources.

The University of Iowa has a decentralized library system. Most of the chemistry and chemical engineering literature is accessible on the web. Engineering and some chemical engineering literature is housed in the Engineering Library (2100 SC). Loan policies vary by library; however, graduate students typically may check out books for one semester. All material is subject to recall.

H. Secretarial Assistance/Copy Machine/Laser Printer

Secretarial assistance is limited to that needed to discharge the responsibilities of an assistantship or other appointment. T.A.'s are encouraged to type their own lecture material using a personal computer. Personal typing such as thesis, class material, homework, etc. is the responsibility of the student.

Use of the department copy machine is limited to that needed to discharge the responsibilities of a teaching or research assistantship.

I. Use of Teaching Equipment for Graduate Research

In general, it is the policy of this department that equipment of the instructional laboratories may not be used for graduate study. Limited short-term or occasional use for graduate research may be approved by the Director of Undergraduate Laboratories or the DEO. The equipment must remain in the instructional laboratory, and such usage must not interfere with the instructional use of the equipment. The research advisor must certify in writing that use of the equipment is essential to the research project and that the advisor and student will be responsible for repairing any damage to the instruments that arise from their use. The research advisor must also agree to pay for supplies and incidental items used by his students while using instructional equipment. This is necessary to cover the cost of such items as paper, pens, syringes, cuvettes, reagents, etc. The users must be trained to use the equipment properly and safely. Any equipment problems must be reported immediately to the Director of Undergraduate Laboratories or the DEO. Arrangements for repairs due to damage or wear from non-instructional use must be made immediately from non-departmental funds. For use of the instruments after hours, room access may be granted with the permission of the Director of Undergraduate Laboratories or DEO. Any violation of these policies may result in the loss of instructional equipment use privileges.

In extraordinary circumstances, instructional equipment may be loaned to faculty advisors for research purposes for a limited time (typically four weeks or less). A written request must be submitted to the Director of Undergraduate Laboratories or DEO. Approval will be granted only if undergraduate teaching will not be impaired and the faculty advisor has taken steps to purchase the needed equipment. In no case will teaching equipment be loaned for more than one semester.

J. Gas and Gas Cylinders

Gas for experiments is purchased through a contract with Praxair. Email the department administrator and ask if there is an existing account for a particular lab or project. If an account does not exist, work with the department administrator and he/she will set one up for you. If an account exists, email the department administrator with the type of gas needed, size of cylinder, serial number, lab location, your phone number so you can be contacted when cylinders arrive, and the account that will pay for the gas and cylinder rental. The gas cylinders will be delivered to the laboratory. The gas is purchased; however, the gas cylinders are rented. Projects will be charged a monthly rental fee for each cylinder ordered until the cylinder is returned to Praxair. These fees can add up quickly and students are requested to return cylinders as soon as they are no longer needed. Email the department administrator to have the empty cylinders picked up. All gas cylinders should be stored, transported and used according to University safety policies and training courses.

K. Safety and Hazardous Materials

All chemicals in the laboratory should be considered potentially hazardous. Safety Data Sheets (SDS) are available online for most of the chemicals used in your laboratory. The SDS contains information regarding the potential chemical, physiological, mechanical and other hazards associated with the chemical. Check with your faculty advisor, the department office or the Environmental Health and Safety Office in order

to see the SDS of interest to you. Laboratory instructors are responsible for providing SDS on all chemicals used in the course to the graduate T.A.'s. The T.A.'s are then responsible for making them available to the laboratory students before they start the lab.

Each experimental laboratory must have at least one person designated and trained to dispose of hazardous waste.

The PI of each laboratory is responsible for initial and annual training of all students and staff working in the lab. Typical training requires online training in Chemical Safety for Labs, Safety Procedures for UI, PPE (Personal Protective Equipment) Awareness for Labs, Hazardous Material Preparedness and Spill Response, Biohazardous Waste, and lab specific training in the Chemical Hygiene Plan / Lab Chemical Safety which covers access to MSDS sheets, training and Standard Operating Procedural requirements for the specific lab, evacuation routes, and PPE requirements for the lab. Initial and annual training, such as in compressed gasses, laser safety, blood borne pathogens, ionizing radiation, or other topics may be appropriate.

Please see a senior member of the lab or faculty member if you are unsure of a safe procedure, or of the training and training documentation requirements for your research.

XII. EMERGENCY PROCEDURES

Please consult lab specific safety policies/procedures and the University of Iowa appropriate procedures and policies, such as the University Laboratory Chemical Hygiene Plan.

But, in summary, in the event of fire or chemical hazard, you should leave the building and call for help. Fire extinguishers, fire alarms, eyewash fountains and emergency showers are in all laboratory areas. Note the location of these devices near your office or laboratory.

For all emergency situations where immediate assistance is required (major chemical spill, serious injury, police, fire or ambulance) call 911.

For other emergencies call Public Safety (335-5022), e.g. break-Ins or illegal entry to labs, personal injuries, theft, or other crimes.

For building emergencies call Facilities Maintenance Work Control Center (335-5071) and Departmental or Building administrators. After working hours, call the Facility Services Group emergency number, 335-5063, or Public Safety, 335-5022. Examples of building emergencies include loss of electricity, lack of fume hood ventilation, leak in gas, steam or water lines, elevator problems, heating/AC problems, storm damage, and snow removal.

In emergency calls, state your location, the nature of the trouble and the assistance you are requesting. Finally, you should report all problems and emergency situations to your faculty advisor and to the DEO as soon as possible.

If you are injured while at the University, it is important to get proper medical treatment and to alert your supervisor of the injury. You may be provided no-cost treatment at a University-approved clinic, and you will likely be asked to participate in an accident investigation to help prevent accident reoccurrence.

Your supervisor must file a First Report of Injury within 24 hours of the incident, following chapter on Accidents in the University Operations Manual. The form is available through HR Employee Self-Service. Contact the Environmental Health & Safety for assistance if needed.

XIII. APPENDIX

A. AIChE Code of Ethics (Nov 2015 version)

Members of the American Institute of Chemical Engineers shall uphold and advance the integrity, honor and dignity of the engineering profession by: being honest and impartial and serving with fidelity their employers, their clients, and the public; striving to increase the competence and prestige of the engineering profession; and using their knowledge and skill for the enhancement of human welfare. To achieve these goals, members shall:

1. Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties.
2. Formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public.
3. Accept responsibility for their actions, seek and heed critical review of their work and offer objective criticism of the work of others.
4. Issue statements or present information only in an objective and truthful manner.
5. Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality.
6. Treat all colleagues and co-workers fairly and respectfully, recognizing their unique contributions and capabilities by fostering an environment of equity, diversity and inclusion.
7. Perform professional services only in areas of their competence.
8. Build their professional reputations on the merits of their services.
9. Continue their professional development throughout their careers, and provide opportunities for the professional development of those under their supervision.
10. Never tolerate harassment.
11. Conduct themselves in a fair, honorable and respectful manner.

B. Annual individual development plan

FOR NON-THESIS MS STUDENTS

Please contact the Department office for the most recent template of the IDP

C. Annual Research individual development plan

FOR MS THESIS AND Ph.D. STUDENTS

Please contact the Department office for the most recent template of the IDP

D. Ph.D. COMPREHENSIVE PROPOSAL FORMAT

Cover Sheet. Includes distinct project title (maximum of 80 characters), name, etc.

Project Summary. Maximum of 250 words. This should be page 1 of the proposal, with this and each succeeding page number centered at the bottom of the page.

Table of Contents.

Research Plan. This section is a maximum of 25 pages. It can be single spaced, but must have 1" margins on all sides and a font size of at least 12 (Times New Roman preferred). This limit includes all figures and tables, but not the "Literature Cited" section. The research plan should answer the following questions. What do you intend to do? Why is the work important? What has already been done? How are you going to do the work? This plan should be hypothesis-driven. This section should contain the following subsections:

Specific Aims. Should have 2 to 3 specific aims. It is recommended that this section be limited to 1 page.

Background and Significance. Review of relevant literature and justification of research (i.e., why is the work important?).

Preliminary Results.

Research Design and Methods. This section should be related back to the specific aims, i.e., the first 4 subsections given below should be written for each specific aim.

Experimental Design. This section should briefly discuss the strategy behind the experiments that will be conducted to address the specific aim in question.

Expected Results. What results do you expect to obtain?

Potential Problems. What potential problems could arise by following the proposed plan, i.e., what could go wrong? Should briefly discuss alternative approaches for those cases where potential problems could arise.

Methods. This section includes the methods that will be used, written in a format similar to the methods section of journal articles. For established methods you should give a brief overview of the methods and cite literature references that can be consulted for additional details.

Proposed Time Table (i.e., “Gantt Chart”).

Literature Cited. This should include complete references (including journal article titles) and be given alphabetically based on the first author's last name.

Biographical Sketch. A biographical sketch is required and should be completed as follows (2-page limit):

- Complete Contact Information.
- Education and Training. List all of your post-secondary educational and training experiences.
- Professional Experience. List positions (including co-ops and internships) directly relevant to research.
- Publications. List your publications that are relevant to the proposed project.
- Presentations. Provide information about your conference presentations that are relevant to the proposed project.
- Honors and Awards. List all of your relevant honors and awards.