

**GRADUATE STUDENT POLICIES**  
**Department of Chemical and Biological Engineering**  
**Colorado State University**

**INTRODUCTION**

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Welcome to the Department of Chemical and Biological Engineering. We hope that you enjoy your program of study and work in our department. The *Graduate Student Policies* are designed to inform graduate students of their role and responsibilities, and to make explicit the program requirements in the Department of Chemical and Biological Engineering. It is your responsibility to familiarize yourself with these policies and to abide by them. You are also expected to familiarize yourself with the Graduate School's [Graduate and Professional Bulletin](http://graduateschool.colostate.edu/faculty-staff/bulletin.aspx), available at <http://graduateschool.colostate.edu/faculty-staff/bulletin.aspx>. If you have questions, comments, or concerns about your program or the Department, please contact your adviser, department staff, or the Department Head.

## IMPORTANT INFORMATION FOR NEW GRADUATE STUDENTS

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### Housekeeping, Safety, and Responsible Conduct in Research Training

All students are required to obtain the necessary training to safely conduct their research. The following may be required:

- All students engaged in any research or scholarly activity must complete the online *Responsible Conduct in Research* training (available at <http://rcr.colostate.edu/training.html>).
- All students must familiarize themselves with the *Facility Safety Plan* (available at [http://cbe.colostate.edu/cheme/pages/documents/CBESafety\\_Manual\\_KLM12-11-06-mk-1.pdf](http://cbe.colostate.edu/cheme/pages/documents/CBESafety_Manual_KLM12-11-06-mk-1.pdf))
- All students working in laboratories must complete *the Hazardous Waste Generator* training offered by Environmental Health Services. The *Hazardous Waste Generator Training* must be completed before any research activity is commenced, if the lab that the student is working in contains hazardous chemicals or has a safety risk, even if the student will not work directly with those hazards.
- Students must complete other training and relevant courses that pertain to their research activities (e.g. laser safety, biosafety, and radiation safety training).

Students must maintain current training certification (e.g. annual recertification) while they are actively engaged in research.

Research laboratories and study desks are places of work that require a serious work attitude. For safety reasons these areas must be kept clean, tidy and organized at all times. In addition, safe work practices must be followed in all activities.

A graduate student using University or Department vehicles must be an employee of the University and have a valid Colorado driver's license for the vehicle concerned. The driver must follow rules pertaining to safe vehicle operation. It is the driver's responsibility to ensure that the vehicle is in a safe condition and to adhere to required maintenance procedures. Personal use of these vehicles is not permitted. Should an accident occur involving injury or property damage, the circumstances and extent of the loss must be reported to the Department office as soon as possible after the occurrence.

### Academic Integrity and Professional Conduct

All students are subject to the policies regarding academic integrity found:

- at <http://www.catalog.colostate.edu/front/policies.aspx>,
- in the current *General Catalog* under “Policies and Guiding Principles,” and
- in the [Graduate and Professional Bulletin](#) under “Student Rights and Responsibilities.”

Examples of academic dishonesty can be found in these sources. Faculty, graduate students, and undergraduates all have a responsibility to uphold the integrity of their scholarly work. As part of this responsibility faculty must deal promptly and appropriately with any credible suspected cases of academic dishonesty on the part of a student. This will include promptly investigating all suspected cases of academic dishonesty, and reporting all cases to the Office of Conflict Resolution and Student Conduct Services, when any penalty is imposed. Penalties may include a failing grade for a course, failing a preliminary or final examination, and/or dismissal from the University.

While executing their teaching, research, and course work, a student interacts with many persons, particularly closely with his/her adviser. This provides an opportunity for students to develop skills in working effectively with others that will be of importance throughout their future professional careers. Students are expected to conduct themselves in a courteous and professional manner in all their

dealings with others, and particularly in their interactions with their adviser. Any problems involving discriminatory/rude behavior or sexual harassment will be dealt with promptly by the Department Head, who will take whatever appropriate actions are needed to correct the problem.

#### Use of University Resources, Building Access, and Parking

All purchases of supplies and equipment, meeting registrations, and travel arrangements made by graduate students must be approved by their adviser in advance and be charged to the appropriate university account. Any such purchases made by a student without the proper approval are solely the financial responsibility of the student.

Through payment of the computing fee, graduate students have access to the College of Engineering computing facilities. If the research contract or student funds do not provide for adequate computing capability, students should confer with their advisers to arrange additional computing access.

Graduate students will be issued keys to specific desk spaces, laboratory, and/or work areas. No master keys will be issued to graduate students under any circumstances. Formal key assignments will be made through the Department by completion of the University's *Key Authorization Form*. All keys must be returned as part of the student's final Department check-out prior to graduation.

Colorado State University Zone A parking permits will not be issued to graduate students under any circumstances.

#### Obligations of Students Supported on Graduate Research Assistantships (GRAs)

Students supported on a half-time GRA will also be assigned grading responsibilities. These might include grading, lecturing, and/or holding office hours for undergraduate CBE courses. Typically, students are not assigned grading responsibilities during their first and last semesters of their graduate programs. Grading responsibilities will be coordinated with the instructor of the course to which the student is assigned.

Graduate assistantships are renewed annually based on satisfactory progress toward degree completion. All graduate students are expected to diligently pursue their respective graduate programs. However, graduate assistants are classified as "at-will" employees by the State of Colorado, meaning that employment can be terminated at any time. The Department will make every effort to ensure funding for students making satisfactory progress towards their degree.

Most advisers arrange for meetings with their students on a regular basis to provide for review of research progress. Uniform progress is important both for the student's timely completion of thesis/technical report requirements for the M.S. or Ph.D. degrees, and also for formal reports normally required by sponsors of research projects. Students are paid over the period of their degree programs with the implicit understanding that successful completion of their programs involves contributions (such as data collection, analysis of data, summarizing results) leading to completed theses, reports, and publications. By its nature, research is a process requiring flexibility in the time devoted to achieve the desired end. This ongoing process often requires a time commitment well beyond a typical "nine-to-five" work schedule to complete the research objectives and publication requirements in a reasonable time. Reasonable times to graduation are one-and-a-half to two years for the M.S. programs and four to five years for a Ph.D. program.

A formal tracking of these research/thesis requirements is accomplished through course credits taken in CBE 699 or 799 (and in special circumstances, CBE 695 or 795). The adviser/instructor has latitude to

assign letter grades for these research credits over a period of semesters, with the full expectation that such research will be satisfactorily completed. An adviser/instructor has complete authority to retroactively change grades given in good faith to U or F if a student fails to satisfactorily complete thesis/report requirements at a later date. Attendance at Departmental Seminars is a requirement for satisfactory progress towards degree completion. All graduate assistants are to be evaluated annually by their advisers, and any problems involving lack of satisfactory progress toward thesis/research requirements will be communicated to the Department Head, who will take whatever appropriate action is needed to correct the problems.

Graduate students, at their adviser's discretion, are eligible for up to ten days of vacation each year, in addition to the 11 paid University holidays. Students must arrange their time off with their adviser, at least 30 days in advance of the leave. Students are expected to be working on their research when classes are not in session unless they are on approved leave.

## GRADUATE PROGRAM REQUIREMENTS

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The Department offers M.E., M.S., and Ph.D. degrees. There are two alternative options for the M.S. degree, which are called “plan A” and “plan B.” The M.E. degree is commonly referred to as “plan C.” M.S. and Ph.D. degree programs have a significant research component and oral examinations. The M.E. degree requires neither a research component nor oral exams. Each of these programs has different course work, research credit, and exam requirements. These requirements are summarized in Table 1 and described in detail in the text that follows. Approximate timelines for each of these programs are shown in Box 3.

### Ph.D. Degree

**Credit and Course Requirements:** A minimum of 72 credits beyond the bachelor's degree must be approved for credit by the student's graduate committee. A master's degree from an accredited college or university may be accepted for a maximum of 30 credits. The number of these credits should be determined by an evaluation of student's master's transcript using the form in the appendix. This evaluation will be completed by the graduate affairs committee, in consultation with the student and the student's adviser. An additional 10 credits may be transferred for courses taken after a student's master's degree was awarded. The graduate admissions committee will determine how many coursework and research credits will be accepted for transfer, with the goal of aligning these credits as closely as possible with the requirements of our Ph.D. program. For students who complete a CBE M.S. degree at Colorado State and are continuously enrolled, all credits earned in their M.S. program may be applied towards the Ph.D. credit requirements, even if the number of credits exceeds 30. A minimum of 40 semester credits beyond the bachelor's degree must be at or above the 500 level. A maximum of 44 credits of research at the doctoral level (CBE 799) may be counted toward the degree requirements.

CBE Ph.D. students must satisfactorily complete the CBE core courses (see Box 1) or their equivalents, and at least three additional credits of advanced mathematics at the 500 level or above (see Box 2). Ph.D. students must also take a minimum of 12 additional elective credits. A maximum of 44 dissertation research credits (CBE 799) may be counted toward the degree requirements. Ph. D. Students are also required to attend the Department Seminars whenever they are held as a condition of making satisfactory progress towards their degree, except when regular coursework conflicts with the time.

**Examinations and Dissertation:** All CBE Ph.D. students must pass a preliminary examination as a requirement for continuing in the program. This should be completed no later than the student's third semester. At the end of the Ph.D. program, an acceptable dissertation must be submitted to and approved by the student's graduate committee. Satisfactory performance on a final oral examination, which includes a defense of the dissertation, is required. See the section entitled “Research Documents and Examinations” for more information. It is expected that the student's Ph.D. research will result in at least two refereed publications or other high-caliber technical publications.

**Table 1. Summary of requirements by degree. Other restrictions apply. See text for details.**

	<i>Ph.D.</i>	<i>M.S. (Plan A)</i>	<i>M.S. (Plan B)</i>	<i>M.E.</i>
<b>Total Credits</b>	72	30	32	30
Coursework				
Core CBE courses <sup>1</sup>	13	13	13	12
Additional Math <sup>2</sup>	3	-	-	-
Electives (min)	12	6	16	18
Research (max)	44 (CBE 799)	11 (CBE 699)	3 (CBE 699)	-
<b>Research Document</b>	Dissertation	Thesis	Report	(None)
<b>Oral Examinations</b>	Preliminary, Final	Final	Final	(None)

<sup>1</sup>See Box 1 for a list of the CBE core courses.

<sup>2</sup>See Box 2 for a list of approved advanced mathematics courses.

**Box 1. Core CBE courses required for all graduate degrees:**

CBE 501: Chemical Engineering Thermodynamics (3 cr., F)  
 CBE 502: Advanced Reactor Design (3 cr., F)  
 CBE 503: Transport Phenomena Fundamentals (3 cr., S)  
 CBE 521: Mathematical modeling for chemical engineers (3 cr., F)  
 CBE 693: Seminar (1 cr. F) (for Ph.D. and M.S. students only)

**Box 2. Courses satisfying the additional mathematics requirement for the Ph.D.**

CBE 680; MATH 535, 540, 545, 546, and 550; and PH 571 and 572

*M.S. Degree Plan A (Thesis option)*

**Credit and course requirements:** A minimum of 30 credits of course work and research must be approved for graduate credit by the student's graduate committee. 24 of the 30 credits must be earned at Colorado State University. 21 of the credits must be earned after admission to the Graduate School. At least 16 credits at Colorado State University must be taken in courses numbered 500 or above, including thesis credits. At least 12 of these 16 credits must be in regular (lecture/laboratory) courses.

CBE M.S. students must satisfactorily complete the CBE core courses (see Box 1) or their equivalents. M.S. Plan A students must also take a minimum of 6 elective credits. A maximum of 11 thesis research credits (CBE 699) may be counted toward the degree requirements. Students are also required to attend the Department Seminars whenever they are held as a condition of making satisfactory progress towards their degree, except when regular coursework conflicts with the time.

**Research, thesis, and final exam requirements:** An acceptable thesis must be submitted to and approved by the student's graduate committee. Satisfactory performance on a final comprehensive examination administered by the student's graduate committee is required. See the section below entitled Research Documents and Examinations for more information. It is expected that the student's M.S. research will result in at least one refereed publication or other high caliber technical publication.

*M.S. Degree Plan B (Non-thesis option)*

**Credit and Course Requirements:** A minimum of 32 credits of course work and research must be approved for graduate credit by the student's graduate committee. 24 of the 30 credits must be earned at Colorado State University. 21 of the credits must be earned after admission to the Graduate School. At least 16 credits at Colorado State University must be taken in courses numbered 500 or above. At least 12 of these 16 credits must be in regular (lecture/laboratory) courses.

**Box 3. Approximate timelines for graduate Ph.D. and M.S. programs in CBE.**

<i>Semester</i>	<i>Ph.D.</i>	<i>M.S (Plan A)</i>	<i>M.S. (Plan B)</i>
<b>1</b>	Take CBE 501, 502, and 521. Take CBE 693. Select research adviser. Begin research (CBE 699 for M.S. students, CBE 799 for Ph.D. students)		
<b>2</b>	Take CBE 503, a math course (see box 2.) and an elective course. Continue research. Begin preparing for preliminary exam.	Take CBE 503 and a math course (if not taken already) and an elective course. Continue research. Begin preparing thesis. Complete GS-6 form.	Take CBE 503 and a math course (if not taken already) and an elective course. Continue research. Begin preparing report. Complete GS-6 form.
<b>3</b>	Complete GS-6 form and preliminary exam. Continue elective courses and research.	Finish elective courses. Complete research and thesis. Pass final exam.	Finish elective courses. Complete research and report. Pass final exam.
<b>4 and beyond</b>	Finish elective courses. Complete research and dissertation. Pass final exam.		
<b>Before leaving CSU</b>	Complete all research manuscripts. Complete department check out. Graduate!		

CBE M.S. students must satisfactorily complete the CBE core courses (see Box 1) or their equivalents. M.S. Plan B students must also take a minimum of 15 elective credits. M.S. Plan B students must satisfactorily complete 2 credits of thesis research (CBE 699). A maximum of 3 credits of CBE 699 may be counted toward the degree requirements. Students are also required to attend the Department Seminars whenever they are held as a condition of making satisfactory progress towards their degree, except when regular coursework conflicts with the time.

**Research, report, and final exam requirements:** An acceptable research report must be submitted to and approved by the student’s graduate committee. Satisfactory performance on a final comprehensive examination administered by the student’s graduate committee is required. See the section below entitled *Research Documents and Examinations* for more information.

*M.E. (Course work only)*

**Credit and Course Requirements:** A minimum of 30 credits of course work is required. 24 of the 30 credits must be earned at Colorado State University. 21 of the credits must be earned after admission to the Graduate School. At least 24 credits at Colorado State University must be taken in courses numbered 500 or above. No independent study, research, internship, supervised college teaching, or practicum credits may be credited towards the degree. No thesis, project or final examination is required.

CBE M.E. students must satisfactorily complete the CBE core courses (see Box 1) or their equivalents. In addition the student must complete an additional 6 credits in regular CBE courses at the 500 level or above (i.e. a total of at least 15 credits in CBE courses at the 500 level or above), and an additional 12 elective credits. Up to 6 credits of courses at the 400-level may be used to satisfy the 30 credit course requirement for the M.E. degree. Neither 400-level CBE courses, nor credit for CBE 693 may be used to satisfy any of the course requirements for the M.E. degree.

# GRADUATE PROGRAM COMMITTEE AND PROGRAM OF STUDY

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## The GS-6 Form

Each student must meet with his or her adviser to formulate a program of study, which must be submitted electronically to the Graduate School on form GS-6. A worksheet that can be used to prepare the GS-6 form is in the Appendix of this document. The GS-6 form is accessed and submitted via [RAMweb](https://ramweb.colostate.edu/), <https://ramweb.colostate.edu/>. The program of study contains the following three important elements:

- a program of course work, that identifies which classes will be taken and when (including any background or make-up courses);
- a proposed research area;
- and the names of the graduate program committee members.

The Graduate School requires that the student submit the GS-6 before the end of the third semester of registration. However, it may be necessary to submit the GS-6 earlier in order to finalize the course work program. For Ph.D. students, submission of the GS-6 form is typically a requirement of CBE 693 taken during the student's third semester.

## The Graduate Program Committee

M.S. and Ph.D. students have a graduate program committee composed of at least 2 (M.S.) or 3 (Ph.D.) CBE faculty members and one faculty member from another department at CSU. The student's adviser is a member (and chair) of the committee. The student shall, in consultation with their adviser, invite additional committee members to serve on their committee. Faculty who agree to serve on the committee shall be listed on the GS6 form. The committee functions in an advisory role to the student and is responsible for conducting the student's final examination (and the preliminary examination for Ph.D. students). It is the student's responsibility to keep the committee informed of progress toward completion of the degree requirements throughout the degree program. A progress report (verbal or written) at a minimum of once per semester (or about three times per year) is required. More frequent contact with the committee is desirable and is encouraged.

## Registration

All graduate students at Colorado State University are required to be continuously registered in the fall and spring semester throughout their degree programs, even if they do not need any more credits to meet graduation requirements. This policy applies to the time of first enrollment through the graduation term. Registration is also required during the summer term if University resources are used. (Students on summer assistantships must register for CR-ON or regular credit course(s) in order to remain on an assistantship.) Students may fulfill this requirement by registering for any graduate credit-bearing course (regular or non-regular). As an alternative, students may opt for Continuous Registration (CR) status. Registration for CR status is accomplished in the same way as registration for courses. Section ID numbers for on-campus (primarily on-campus) and off-campus (absent from campus) appear in the class schedule under the CR prefix (CR-ON and CR-OFF). Graduate students registered full time (9 or more credits) are encouraged to maximize their registration to 15 credits.



## RESEARCH DOCUMENTS AND EXAMINATIONS

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Ph.D. students take a preliminary examination and M.S. and Ph.D. students take a final examination. These examinations involve both a written and oral component wherein the student communicates and defends his/her research. The sections below describe these examinations in more detail.

### Ph.D. Preliminary Examination

The preliminary exam should ordinarily be completed around the end of the first year of study, though it is not uncommon for students to take the exam later. The Graduate School requires that the preliminary exam be completed no less than two terms before the final exam. (See Section E.4.4 of the [Graduate and Professional Bulletin](#).) Therefore a student taking the preliminary exam after the first day of classes for the spring term (but before the end of the spring term), cannot take the final exam before the first day of classes of the fall term. The term during which the exam is taken counts as the first term; spring, summer, and fall each count as a term. Only students who have a committee identified will be allowed to take the exam.

The goal of this exam is to satisfy the graduate program committee, the Department, and the Graduate School that a graduate student has the necessary core knowledge and the potential to carry out independent research to successfully complete a Ph.D. in chemical engineering. To make this determination, the committee will consider the background of the student, their performance in their coursework to date, and their performance on both the written and oral components of the exam. A grade lower than a B in any graduate courses, particularly the core CBE and mathematics courses would be a strong indication that a student does not have the core knowledge necessary for a Ph.D. in chemical engineering. In judging the performance of the student on the written and oral components of the exam, several factors will be considered. Specifically, the committee will judge whether the student:

1. has an acceptable mastery of chemical engineering knowledge, equivalent to the content of the chemical engineering core courses in thermodynamics, chemical kinetics and chemical reactor design, and transport phenomena;
2. has an acceptable understanding of the literature in his/her research area;
3. has an ability to formulate meaningful research objectives that will make a significant contribution to their field, plan and conduct research that addresses those objectives, and interpret the results of their research;
4. has made tangible progress toward his/her research problem.

Satisfactory performance in each of these four requirements is necessary to pass the preliminary examination. For item 4 above, tangible progress may include, but is not limited to, detailed literature surveys pertinent to the project, compilation and analysis of relevant data published by other investigators, learning important techniques, instrumentation, or theory, clear presentation of the work to be carried out, and demonstration of the novelty of the work. Tangible progress may further include published or publishable results, building of an apparatus, progress on multi-step processes, collection of data, progress on writing computer code for simulation or data analysis, development of an analytical technique, etc. Tangible progress is *not* to be interpreted solely as publishable results: level of effort, persistence, and determination are the key to this criterion. Students who have accomplished much research, but who have a shallow depth of understanding will not pass; students who have a solid academic knowledge, but who have accomplished little or no research will not pass.

The student must distribute to his/her committee a written research report at least one week before the exam. The report should be a detailed and complete description of the research that the student has conducted and intends to conduct to complete the research component of their degree. The report should contain relevant background (concise literature review that provides context for their contributions to the field), status of research conducted to date, planned future research, a timeline for completion of the work, and references. Relevant display items, such as diagrams of apparatus designed and/or built by the student, figures, tables, data, schemes, etc. should be prepared in a professional manner and used to effectively communicate necessary information. As a guideline, the report should generally be approximately 12 to 15 double-spaced pages in length (text), exclusive of any references or display items (figures, tables, schemes, etc.). This is a guideline, not intended to be an absolute length requirement. The research report written by the student must reflect their own work; no proofreading or editing should be done by any faculty member prior to the exam. It is expected that a student may wish to show their adviser the report to get feedback on format. However, it is important to recognize that the way the report is put together is a measure of a student's thought process and an important element of evaluation, and that the adviser must not interfere.

The student is responsible for obtaining form GS-16 (*Report of Preliminary Examination*) from the graduate school website and bringing it to the exam. This form will be completed during the exam, and the student must return it to the graduate school upon completion of their exam. At the exam, the student will first present their current research and research plans in a 30-minute seminar before his/her committee. The remainder of the exam will consist of a question-and-answer period focusing on basic chemical engineering knowledge and on the student's research.

If a student does not pass the preliminary oral examination, the committee may allow the student to retake the exam. Reexaminations will only be allowed if the committee feels that the student has a significant potential to pass the reexamination. If the committee permits a reexamination, they will provide guidance to the student on shortcomings that should be addressed, and the reexamination must be completed no sooner than two months and no later than four months from the date of the original exam. For the reexamination, the student may be required to complete further work. In some cases the committee will identify specific weaknesses in the student's performance. These will be communicated to the student in a timely fashion so that deficiencies can be rectified for the reexamination. Failure in the reexamination will result in dismissal from the Ph.D. program. Students who fail and who have not yet completed an M.S. or an M.E. degree will be encouraged to do so before leaving the University. Students passing the preliminary examination or reexamination, will continue in the Ph.D. program, and will remain in the program until submission and defense of the dissertation, provided that satisfactory progress is maintained. For these students the preliminary examination may also serve as the M.S. Plan B final examination, and the research report may be submitted to the Department as the Plan B report; the M.S. degree will then be awarded subject to completion of the necessary course work.

#### M.S. and Ph.D. Final Examinations

M.S. and Ph.D. students must pass a final examination at the end of their program. Ph.D. students are not allowed to take the final exam until two terms after completion of the preliminary exam. (See *Ph.D. Preliminary Examination* section above for an explanation of this timing.) The student is responsible for obtaining form GS-24 (*Report of Final Examination Results*) from the graduate school website and bringing it to the exam. This form will be completed during the exam, and the student must return it to the graduate school upon completion of their exam.

Final exams include submission of a research document (dissertation, thesis, or report, as indicated in Table 1), seminar before the committee, and question-and-answer session. Students should submit their research document to their committee at least two weeks prior to their scheduled exam. This document

should be a complete report of the research that the student has conducted. Ph.D. dissertations and M.S. theses should be prepared according to the [Thesis Manual](#) available from the Graduate School website (<http://graduateschool.colostate.edu/>). The document should include a substantial literature review and background section or chapter that concisely surveys the particular field or fields of engineering and science that their work contributes to. This should demonstrate that the student clearly understands how their own work relates to the most important contributions that have been recently made to the field they are working in. The motivation and objectives of the student's research should be made clear (e.g. what hypotheses are being tested and/or what knowledge gap is being filled). Relevant display items, (e.g. diagrams, figures, tables, data, schemes, etc.) should be prepared in a professional manner. Unlike Ph.D. preliminary exams, the adviser and committee members may provide substantial input during preparation of the research document. Sections or chapters of the document may be reproduced from the student's publications, but should represent only the student's own work (e.g., publications on which they are the primary author).

For Ph.D. final exams, the student's research seminar before the committee is a public event. All graduate students are encouraged to attend their colleagues' seminars. Generally, the public audience will be given an opportunity to question the Ph.D. candidate before the committee examines the student. The question-and-answer session with the committee for both M.S. and Ph.D. students is not a public event. At the discretion of the committee, select guests may be allowed to participate (e.g. a collaborator who does not happen to be a member of the committee).

In the research report and the seminar, the results of the research should be reported and interpreted at a level appropriate to the degree program. M.S. students should demonstrate that they have substantial expertise in the particular field they are working in, with the ability to define significant research problems and conduct the research necessary to address those research problems. Ph.D. students should additionally demonstrate that they have the capacity to make significant novel experimental and theoretical contributions that lead to advances in their field. Simply demonstrating mastery of the literature, laboratory techniques, and/or existing theory is not sufficient.

During the question-and-answer session, the committee will discern whether the student:

1. has an acceptable mastery of the chemical engineering discipline at a level appropriate to the degree program;
2. has an acceptable understanding of the literature and other disciplines closely related to his/her research area (e.g. disciplines in which elective courses were taken);
3. has an ability to formulate meaningful research objectives that will make a significant contribution to their field, plan and conduct research that addresses those objectives, and interpret the results of their research;
4. has conducted research that makes some novel contribution to their field, and in the case of Ph.D. students, addresses the research objectives and/or design problems that were defined in the preliminary exam.

The following detailed examples are offered to clarify the criteria (1 through 4) above.

1. This is generally taken to mean that questions of a general chemical engineering nature are "fair game." This includes any topic covered in the three core graduate chemical engineering courses and the student's elective courses. Note that these questions may or may not be related to material in the student's presentation or written research report.
2. This should be interpreted as a working knowledge of the relevant literature in the area related to the student's research, including recent advances, outstanding researchers in the field, and recent publications from the student's own research group. The student should also be able to critically evaluate new research in the context of the current state of the art. Encyclopedic knowledge of the literature is not expected.

3. This should be interpreted as an ability to formulate testable hypotheses and engineering design optimization problems, analyze data critically, identify trends in data, explain data analysis procedures, interpret results by offering possible explanations of observations or comparing plausible alternative theoretical approaches or mechanisms. In addition, the committee also looks for the student's ability to extend beyond the data at hand to identify the "next steps" in the research project, projected outcomes for planned experiments or calculations, potential pitfalls in planned research, and possible alternative research paths.
4. Examples of novel contributions include, but are not limited to, original peer reviewed publications that report new techniques, theories, and/or experimental results, invention disclosures or patent applications, and presentations of research at regional or national meetings of professional organizations (e.g. AIChE, ACS, MRS, etc.).

## **DISSEMINATION OF RESEARCH, PUBLICATIONS, AND ATTENDANCE AT PROFESSIONAL MEETINGS**

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It is the responsibility of every graduate student, with the assistance of his or her adviser, to write and pursue publication of thesis or dissertation research findings in peer-reviewed journals, proceedings, or other appropriate formats. The expectation is that a master's thesis will yield at least one refereed publication and a Ph.D. dissertation will yield at least two refereed publications. This publication effort will be performed as part of the normal program of study. Department funds are not available to support graduate students to write papers after completion of degree requirements.

It is desirable for graduate students to participate in professional meetings. Funding for travel to meetings may be available through research grants. Some professional societies also offer travel grants and awards to students. Students are encouraged to apply for travel grants when they are available.

## PROGRAM COMPLETION AND GRADUATION

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### Publishing Theses and Dissertations

It is the responsibility of the student to cover the costs of writing, typing, and reproducing his or her thesis or dissertation. All theses and dissertations must meet the standards of format and presentation established by the Graduate School and the Library and must be checked by the Department for adherence to those standards. It is the student's responsibility to ensure that his or her thesis or dissertation meets the required standards.

The Graduate School requires that two unbound copies of a thesis or dissertation be submitted to the Graduate School as part of the requirements for graduation. In addition, the Department requires that the student submit one unbound copy to the Department office for inclusion in the Department library. The Department will cover binding expense for the Department copy. It is the responsibility of the student to establish the need for and cover the cost of additional copies of the thesis or dissertation for committee members, funding agencies, sponsors and any other needs as appropriate. These should be submitted prior to the end of the twelfth week of the graduation term (prior to the end of the fifth week of the eight-week summer term for students graduating in summer). Each semester, the Graduate School publishes a schedule of deadlines.

### Department Check Out

It is the student's responsibility to complete a Department check-out form before leaving the University. The form can be obtained from the Department office. All keys must be returned, all desk space must be cleaned up and vacated, all equipment returned, and all work areas must be tidied up. Any samples and chemicals left behind must be clearly labeled. Hazardous waste generated by the student must be turned in to Environmental Health Services before check-out and departure. It is the responsibility of the adviser to ensure that the student leaves his or her work space in a satisfactory condition.

Each graduate student is expected to complete his or her degree program before leaving campus. It is extremely difficult to finish a graduate degree program, no matter how much or how little remains to be done, if a student elects to leave before completion. Not only does this put the degree program in jeopardy, but it also prevents the completion of the research process, including completion of research reports and publications.

### Graduation

Graduate students must apply for graduation by submitting to the Graduate School Office a form GS-25 (*Application for Graduation*) by the appropriate deadline for the term they intend to graduate. Deadlines are published on the Graduate School website. It is the student's responsibility to complete all paperwork required for graduation, together with the payment of all fees. Please inform your adviser and the Department if you plan to attend graduation.

Remember to keep in touch after you leave campus! Each year we hope to correspond with you and all of our alumni to keep you abreast of developments in the Department.

Department Contacts and University Offices

Form GS-6 Worksheet [Program of Study Worksheet and Electronic GS-6 Instructions](#)

Form GS-16 [Report of Preliminary Examination for the Ph.D. Degree](#)

Form GS-24 [Report of Final Examination Results](#)

Form GS-25 [Application for Graduation](#)

Credit Count Worksheet for Students Submitting an MS Degree as Partial Fulfillment of the Ph.D.

<b><u>CBE Department Contact</u></b>	<b><u>Email</u></b>	<b><u>Phone</u></b>
Main office (Marilyn Gross and Claire Lavelle)	<a href="mailto:cbe@engr.colostate.edu">cbe@engr.colostate.edu</a>	491-5252
David Dandy (Department Head)	<a href="mailto:Dandy@colostate.edu">Dandy@colostate.edu</a>	491-5253
Tim Gonzales (Laboratory Manager)	<a href="mailto:Tim@engr.colostate.edu">Tim@engr.colostate.edu</a>	491-2390
Ranil Wickramasinghe (Associate Dept. Head for Graduate Studies)	<a href="mailto:Ranil.Wickramasinghe@colostate.edu">Ranil.Wickramasinghe@colostate.edu</a>	491-5276

<b><u>University Office</u></b>	<b><u>Location</u></b>	<b><u>Phone</u></b>
<u>Emergency (Fire, Ambulance, Police)</u>		911
<a href="http://police.colostate.edu/">Police Department (Non emergency)</a> <a href="http://police.colostate.edu/">http://police.colostate.edu/</a>	Green Hall (750 S. Meridian)	491-6425
<a href="http://www.ehs.colostate.edu/">Environmental Health Services</a> <a href="http://www.ehs.colostate.edu/">http://www.ehs.colostate.edu/</a>	141 General Services	491-6745
<a href="http://www.facilities.colostate.edu/">Facilities/Building Maintenance Dispatch</a> <a href="http://www.facilities.colostate.edu/">http://www.facilities.colostate.edu/</a>		491-0077
<a href="http://graduateschool.colostate.edu/">Graduate School</a> <a href="http://graduateschool.colostate.edu/">http://graduateschool.colostate.edu/</a>	204 Student Services	491-6817
<a href="http://www.colostate.edu/Depts/Registrar/">Registrar's Office</a> <a href="http://www.colostate.edu/Depts/Registrar/">http://www.colostate.edu/Depts/Registrar/</a>	100 Centennial Hall	491-7148
<a href="http://writing.colostate.edu/wcenter/">Writing Center</a> <a href="http://writing.colostate.edu/wcenter/">http://writing.colostate.edu/wcenter/</a>	Willard O. Eddy Hall, Room 6	491-0222
<a href="http://www1.chm.colostate.edu/">Central Instrument Facility</a> <a href="http://www1.chm.colostate.edu/">http://www1.chm.colostate.edu/</a>	Yates Hall	491-6475
<a href="http://www.chem.colostate.edu/stockroom/">Chemistry Stockroom</a> <a href="http://www.chem.colostate.edu/stockroom/">http://www.chem.colostate.edu/stockroom/</a>	Yates Hall	491-6238
<a href="http://www.engr.colostate.edu/ens/">Engineering Network Services Help Desk</a> <a href="http://www.engr.colostate.edu/ens/">http://www.engr.colostate.edu/ens/</a>		491-2917
<a href="http://www.international.colostate.edu/">Office of International Programs</a> <a href="http://www.international.colostate.edu/">http://www.international.colostate.edu/</a>	Laurel Hall	491-5917
<a href="http://www.housing.colostate.edu/">Housing and Dining Services</a> <a href="http://www.housing.colostate.edu/">http://www.housing.colostate.edu/</a>	Palmer Center (1005 W. Laurel)	491-6511
<a href="http://rcr.colostate.edu">Responsible Conduct in Research Office</a> <a href="http://rcr.colostate.edu">http://rcr.colostate.edu</a>	General Services Building	491-1563