CHEMICAL ENGINEERING GRADUATE HANDBOOK
OKLAHOMA STATE UNIVERSITY

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I. INTRODUCTION

Oklahoma State University
"Where People Are Important"

Our program is small enough that we can give one-on-one attention each student deserves, yet large enough to provide the resources needed for quality education and research. Faculty expertise has a balance of industrial experience and theoretical analysis, which contributes to bringing practice oriented applications into teaching efforts and research projects. Many research projects have a strong application component driven by fundamentals and theory. Graduate students find employment after graduation in a variety of industries, ranging from biomedical devices, to process design/control, to energy management. The graduate student body is diverse and dynamic. We have both domestic and international students who organize various activities including picnics, sports, and presentations from industry representatives. Check out http://cheGSA.okstate.edu. Students routinely author or coauthor many publications in scholarly journals and technical reports and participate in regional, national and international conferences. OSU has an exceptional campus social climate comprised of people from diverse cultural backgrounds. The quality of life is excellent in our safe, friendly environment, while cost of living is very low relative to the financial support.

In general, our research areas can be grouped into four categories (shown in the figure). In 2014, our research funding exceeded $5M from various federal agencies and industrial sources.
II. ADMISSION REQUIREMENTS AND PROGRAM OVERVIEW

MS Degree Program

An M.S. degree in Chemical Engineering from Oklahoma State University signifies that the recipient has demonstrated advanced knowledge of fundamental chemical engineering topics. In addition, an M.S. graduate has exhibited the ability to successfully and independently integrate this knowledge to solve complex quantitative problems in a logical manner.

Objectives

Specific educational objectives have been established for the M.S. program, and they can be met through a combination of course work, independent study and other mechanisms (e.g., seminar). These objectives are shown below, along with the criteria used to assess success in achieving them.

<table>
<thead>
<tr>
<th>Educational Objectives</th>
<th>Outcome Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build upon and expand the student’s undergraduate education by emphasizing depth in thermodynamics, transport phenomena, kinetics, and mathematical modeling</td>
<td>Complete the “core” courses in the M.S. curriculum</td>
</tr>
<tr>
<td>2. Expand personal knowledge of the broad range of applications of chemical engineering</td>
<td>Complete three credits of Chemical Engineering Seminar (CHE 6010)</td>
</tr>
<tr>
<td>3. Develop the skills required to work independently to solve unique problems in chemical engineering</td>
<td>Complete an M.S. thesis research project</td>
</tr>
<tr>
<td>4. Attain additional knowledge (breadth and/or depth) in topics related to chemical engineering</td>
<td>Complete at least two M.S. elective courses related to the student’s career objectives</td>
</tr>
<tr>
<td>5. Develop effective written and oral communications skills</td>
<td>Write, and defend orally, an M.S. thesis</td>
</tr>
</tbody>
</table>

The emphasis in course work during the M.S. degree is on depth of understanding of subject matter and on preparing students for careers in the areas of their interest. Depth is obtained through broad-based “core” courses addressing knowledge expected of all chemical engineers, while other courses are targeted toward the student’s research and specific career interests. The core areas include fundamentals and applications of mathematical modeling, thermodynamics, kinetics and transport phenomena. The courses are structured to expand and add depth to the students’ undergraduate knowledge.

Additional “elective” courses must be selected, with the advice and consent of the student’s research advisor, from graduate-approved courses in any department. The choice of courses is
based solely on improving skills related to the student’s educational objectives. Each Fall and Spring Semester, all students will participate in a seminar class to give them an overview of – and appreciation for – the wide range of applicability of chemical engineering knowledge. Students also complete “research” courses as part of the M.S. thesis research project.

**Doctor of Philosophy Degree**

A Ph.D. in Chemical Engineering from Oklahoma State University signifies that the recipient has demonstrated a breadth of advanced knowledge in the subjects that form the foundation of chemical engineering. In addition, the graduate will have demonstrated the ability to independently and efficiently make creative, relevant, significant contributions at the forefront of knowledge in traditional or emerging fields within the Chemical Engineering discipline. The program is designed to prepare the graduate with the widest possible career opportunities as a leader in industrial and academic arenas.

The Ph.D. experience allows the candidate to develop and demonstrate the independent, self-directed, creative, productivity of an accomplished professional. As such, the Ph.D. experience must go well beyond directed classroom courses in which the professor chooses the content, assigns specific homework and grades short-term projects. Personal attributes developed during the Ph.D. program include curiosity, perseverance, creativity, productivity, leadership, communication effectiveness, interpersonal skills, and the ability to develop a comprehensive understanding of any problem under study and its relation to societal needs. Accordingly, qualifications for undertaking the Ph.D. degree are predicated on attributes such as the above, plus indications that the candidate can meet the expectations of independent, accomplished, creative, engineering work. A formal “Qualifying Examination” is administered to determine the student’s readiness to undertake the research component of the Ph.D. program.

Breadth of advanced knowledge is demonstrated primarily by completion of a carefully prescribed “core” of class work. Additional courses may be selected by the candidate and/or prescribed by the Advisory Committee to assist in improving the candidate’s fundamental knowledge base or to allow the candidate to acquire specialized knowledge for the solution of a dissertation research project.

From the Qualifying Exam through the final defense of the dissertation, the candidate develops and demonstrates the ability to: independently identify an area in which research is needed; assemble the relevant existing knowledge; develop the requisite experimental; computational or theoretical skills; synthesize the existing knowledge; available skills and facilities into a scientifically defensible research plan; pursue the plan in an efficient and timely manner to realize a significant result; and organize and communicate his/her ideas and results in a professionally acceptable manner. A required presentation of the research in a public forum is used to further demonstrate the oral communication and organizational skills of the candidate.
Objectives

The specific educational objectives of the Ph.D. program may be met through a combination of course work, independent study and research, and other mechanisms (e.g., seminar). These objectives are expressed in terms of educational development beyond the B.S. degree. The criteria used to assess success in meeting the Ph.D. objectives are also listed, as follows:

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<tr>
<th>Educational Objectives</th>
<th>Outcome Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Build upon and expand the student’s undergraduate education by emphasizing depth in thermodynamics, transport phenomena, kinetics and mathematical modeling</td>
<td>Complete the “core” courses in the M.S. curriculum (or have previously completed equivalent courses in an M.S. degree program)</td>
</tr>
<tr>
<td>2. Expand personal knowledge of the broad range of applications of chemical engineering</td>
<td>Complete six credits of Chemical Engineering Seminar (CHE 6010) (three credits for students entering with an M.S. degree)</td>
</tr>
<tr>
<td>3. Attain additional knowledge (breadth and/or depth) in topics related to chemical engineering</td>
<td>Complete at least five elective courses related to the student’s career objectives</td>
</tr>
<tr>
<td>4. Refine the ability to define a research problem and develop a plan for its solution</td>
<td>Complete three credits of CHE 6703, Research Methods in Chemical Engineering</td>
</tr>
<tr>
<td>5. Demonstrate the independence, initiative and ability to conceive, plan, execute, complete, and defend research work at the frontier of scientific and/or engineering knowledge</td>
<td>Complete and defend a dissertation which includes a clear advance in the state of knowledge in some field of chemical engineering</td>
</tr>
<tr>
<td>6. Develop effective written and oral communications skills</td>
<td>Complete a written qualifying examination and a dissertation, present the results orally, and deliver a formal presentation at a technical society meeting or a CHE seminar</td>
</tr>
</tbody>
</table>
Plan of Study (POS)

A plan of study serves as a contract between a student and the university. Your POS is the blueprint for successful completion of your degree requirements. The student should complete the plan of study for the degree, have it approved by the advisory committee, and submit the original form to the Graduate College. The student should secure the plan of study form from the Graduate College, (http://gradcollege.okstate.edu/planofstudy) develop the plan with the advisor, have it approved by the advisory committee and submit it to the Graduate College for final approval.

- For a master’s program, our program requires the completion of the plan of study by the end of the first semester.
- For the Ph.D. program, our program requires the completion of the plan of study by the end of the second semester.

Changes in the plan of study can be made with the approval of the advisory committee and the dean of the Graduate College. A final, accurate and approved plan must be filed before the end of the second week of the semester in which the degree is to be conferred. The plan of study is subject to modification.

Because the acceptance of work which the student desires to use toward the degree rests with the advisory committee, it is important to plan a complete program and have it approved by the dean of the Graduate College as soon as possible. Graduate credit, up to a maximum of nine hours, used to obtain one master’s degree may, with the approval of the advisory committee, be counted toward completion of another master’s degree.

The plan must include all the acceptable graduate work that has been completed and all that will be taken for the Ph.D. degree. The plan should include (1) at least 75 percent of courses taken at 5000-6000 level, (2) a minimum of 60 hours beyond the master’s degree, and (3) at least 15 hours and no more than 60 hours of dissertation credit. Courses used to earn a master’s degree are not listed on the doctoral plan of study.

- For students with a BS or BA, POS must list exactly 90 credit hours
- For students with an MS degree, POS must list exactly 60 credit hours
- BS Degree, minimum of 36 credit hours/MS Degree, minimum 30 credit hours CHE 6000 PhD Research and Thesis
- BS Degree, 6 credit hours CHE 6010- Chemical Engineering Seminar/MS Degree, 3 credit hours CHE 6010- Chemical Engineering Seminar
- 12 credit hours of CHE Core Courses if BS Degree or MS Degree not from OSU
- Sufficient Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor to make a total of 90/60 credit hours on the POS
Requirements for Training in the Responsible Conduct of Research (RCR)

Education and training in the ethical and responsible conduct of research is an essential element of training for individuals who will be engaged in research in any field. Oklahoma State University policy requires all graduate students to complete, on a one-time-only basis early in their graduate study, an online module about responsible conduct of research (RCR). Click on the link http://compliance.okstate.edu/rcr/rcr-index to access the module.

All new graduate students should plan to complete the module in their first semester. After completing the module, print the completion certificate and bring it to Chemical Engineering office for filing.

Important Links:

- English Language Proficiency for Admission
  http://gradcollege.okstate.edu/content/application-process-0

- Graduate College Round-Up website link for the Plan of Study
  http://gradcollege.okstate.edu/planofstudy

- Responsible Conduct in Research Overview:
  http://compliance.okstate.edu/rcr/rcr-index
IV. DEGREE REQUIREMENTS

MS Minimum Performance Requirements

Satisfactory academic performance is required of all students in the M.S. program. Minimum acceptable performance is evaluated as follows.

If a student receives a grade of “C” in any CHE course, the student’s performance will be reviewed before the beginning of the next semester or summer term by the entire CHE faculty. A decision regarding the student’s retention or dismissal from the program will be made, based on a) overall classroom performance, b) progress to date on the research topic, and c) the faculty’s assessment of the student’s prospect for successful future progress in the graduate program. Results of this review may include, but are not limited to:

a. Continuation in the program,
b. Required enrollment in remedial course work,
c. Required defense of research progress to date and/or an effective outline of future research plans, or
d. Dismissal from the graduate program

In all cases, any CHE course with a grade of “C” must be repeated at the next offering of the course. A grade of “C” in a second course will again result in a review of the student’s progress. In all but the rarest cases, a second “C” in a CHE course (or a “D” or “F” in any course) will result in dismissal from the graduate program. Further, at the completion of 25 or more credit hours in the M.S. program, the student must have a cumulative grade point average (exclusive of CHE 5000, 5990 and 6000) of no less than 3.00/4.00.

In all cases where satisfactory performance is in question, the faculty has the prerogative to alter the degree program of the student. The student may be reassigned to a “Creative Component” option (see Section D.4). For such a reassignment the student will not be eligible to pursue the Ph.D. degree in Chemical Engineering at OSU.

Thesis and Oral Examination

Each M.S. candidate must prepare a written thesis and defend it before an examining committee of at least three faculty members (minimum two from the department). The written document must satisfy the requirements of the Graduate College for format and structure. The thesis defense consists of a twenty-minute (maximum) oral presentation by the student, followed by questions from the committee. Questioning continues for as long as the committee chairman deems appropriate. The student is then dismissed, and the committee deliberates in private. When a decision is reached the committee informs the student of their decision. The committee will normally reach one of the following conclusions:

- The candidate has completed the CHE M.S. thesis requirement,
- The candidate must revise the thesis to the satisfaction of the Examining Committee, with possible reexamination, or
- The candidate has failed the examination and is dismissed from the M.S. program or converted to the creative component option.
Creative Component Option (Non-Thesis)

The M.S. degree may also be earned by the Creative Component option. A minimum of thirty-two (32) semester credits is required by the University for Graduation. The elective courses must approved by the student’s advisor (must include Stagewise - CHE 5633 and Process Simulation – CHE 5373). The CHE 5990 course is used for research, and a report (a “mini-thesis”) must be submitted and defended, prepared in the style of an M.S. thesis, but not submitted for Graduate College approval. **The creative component option is used only in unusual cases, and only at the suggestion of the student’s research advisor.**

Course Work

A minimum of thirty (30) semester credits is required by the University for Graduation; this requirement is met by the CHE M.S. curriculum, which is summarized as follows:

<table>
<thead>
<tr>
<th>Items</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses</td>
<td>CHE 5123 - Advanced Chemical Reaction Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5213 - Selected Diffusional Unit Operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5743 - Chemical Engineering Process Modeling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5843 - Principles of Chemical Engineering Thermodynamics</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>CHE 6010 - Chemical Engineering Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor. <strong>Suggested Elective Courses</strong></td>
<td>6</td>
</tr>
<tr>
<td>Thesis</td>
<td>CHE 5000- M.S. Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>CHE 5990- Special Problems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>30</td>
</tr>
</tbody>
</table>

Minimum Enrollment

First Semester

- Ten (10) credit hours must be taken
- Courses must include all **required** CHE core courses offered that semester
- Remedial English (ENGL 0003) may be taken in place of one of the above courses, if necessary (but may not be used to satisfy any graduation requirement)
- One (1) hour of CHE 6010 must be included

Second Semester

- Ten (10) credit hours must be taken
- Courses must include all **required** CHE core courses offered that semester
• One (1) hour of CHE 6010 must be included

Subsequent Semesters
• At least three (3) hours of CHE 5000 and one (1) hour of CHE 6010 must be taken. This applies to all semesters, including the last semester (or part of a semester) in which the student is enrolled. (In summer sessions, at least two hours of CHE 5000 must be taken; CHE 6010 is not required).
• Minimum enrollment is six hours in the fall and spring semesters, and three hours in the summer. The specific courses will be determined by the student with approval of the advisor.

Exceptions to these minimum enrollment requirements can be made to permit a student to carry fewer than 10 hours in the first two semesters if, upon initial enrollment in the program, the student agrees not to request financial support at any future time while in the M.S. program.

Creative Component Option (Non-Thesis)
The M.S. degree may also be earned by the Creative Component option. A minimum of thirty-two (32) semester credits is required by the University for Graduation; this requirement is met by the CHE M.S. curriculum, which is summarized as follows:

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<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses</td>
<td>CHE 5123 - Advanced Chemical Reaction Engineering</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>CHE 5213 - Selected Diffusional Unit Operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5743 - Chemical Engineering Process Modeling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5843 - Principles of Chemical Engineering Thermodynamics</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>CHE 6010 - Chemical Engineering Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor. <strong>Suggested Elective Courses</strong></td>
<td>15</td>
</tr>
<tr>
<td>Others</td>
<td>CHE 5990 - Special Problems</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>32</td>
</tr>
</tbody>
</table>

The elective courses must approved by the student’s advisor (must include Stagewise - CHE 5633 and Process Simulation – CHE 5373). The CHE 5990 course is used for research, and a report (a “mini-thesis”) must be submitted and defended, prepared in the style of an M.S. thesis, but not submitted for Graduate College approval. The creative component option is used only in unusual cases, and only at the suggestion of the student’s research advisor.
PhD Minimum Performance Requirements

Satisfactory academic performance is required of all students in the Ph.D. program. Minimum acceptable performance is evaluated as follows.

If a student receives a grade of “C” in any CHE course, the student’s performance will be reviewed before the beginning of the next semester or summer term by the entire CHE faculty. A decision regarding the student’s retention or dismissal from the program will be made, based on a) overall classroom performance, b) progress to date on the research topic, and c) the faculty’s assessment of the student’s prospect for successful future progress in the graduate program.

Results of this review may include, but are not limited to:

a. Continuation in the program,
b. Required enrollment in remedial course work,
c. Required defense of research progress to date and/or an effective outline of future research plans, or
d. Dismissal from the graduate program

In all cases, any CHE course with a grade of “C” must be repeated at the next offering of the course. A grade of “C” in a second course will again result in a review of the student’s progress. In all but the rarest cases, a second “C” in a CHE course (or a “D” or “F” in any course) will result in dismissal from the graduate program. Further, at the completion of 25 or more credit hours in the Ph.D. program, the student must have a cumulative grade point average (exclusive of CHE 5000, 5990 and 6000) of no less than 3.00/4.00.

In all cases where satisfactory performance is in question, the faculty has the prerogative to alter the degree program of the student. A Ph.D. candidate may be reassigned to the M.S. program and expected to complete all requirements for that degree. For such a reassignment, the student will not be eligible to pursue the Ph.D. degree in Chemical Engineering at OSU.

Course Requirements

Ph.D. students may enter the program in two ways, either (i) with a B.S. degree in Chemical Engineering to pursue the Ph.D. without obtaining an M.S. degree, or (ii) with an M.S. degree in Chemical Engineering. The requirements for each degree path are as follows:
### Students with a B.S. degree only

<table>
<thead>
<tr>
<th>Items</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses</td>
<td>CHE 5123-Advanced Chemical Reaction Engineering</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>CHE 5213 - Selected Diffusional Unit Operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5743 - Chemical Engineering Process Modeling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 5843 - Principles of Chemical Engineering Thermodynamics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHE 6703 - Research Methods in Chemical Engineering</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>CHE 6010- Chemical Engineering Seminar</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>Graduate-approved elective (CHE or other) courses, selected by the student, with</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>approval of the student's advisor. Suggested Elective Courses.</td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td>CHE 6000- Doctoral Thesis (With approval of the student’s advisory committee,</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>additional elective courses may be taken, with a corresponding reduction in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>required credits in CHE 6000; but the number of CHE 6000 credits may be no less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>than 36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>90</strong></td>
</tr>
</tbody>
</table>

### Students with a M.S. degree from OSU

<table>
<thead>
<tr>
<th>Items</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses</td>
<td>CHE 6703 - Research Methods in Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Seminar</td>
<td>CHE 6010 - Chemical Engineering Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>Graduate-approved elective (CHE or other) courses, selected by the student, with</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>approval of the student's advisor. Suggested Elective Courses.</td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td>CHE 6000- Doctoral Thesis (With approval of the student’s advisory committee,</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>additional elective courses may be taken, with a corresponding reduction in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>required credits in CHE 6000; but the number of CHE 6000 credits may be no less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>than 30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>
Students with a M.S. degree not from OSU

Students in this category will be required the following in addition to the requirements for students with a M.S. degree from OSU

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Core courses</td>
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<td></td>
<td>CHE 6703 - Research Methods in Chemical Engineering</td>
<td></td>
</tr>
<tr>
<td>Seminar</td>
<td>CHE 6010 - Chemical Engineering Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor. <strong>Suggested Elective Courses.</strong></td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td>CHE 6000- Doctoral Thesis (With approval of the student’s advisory committee, additional elective courses may be taken, with a corresponding reduction in required credits in CHE 6000; but the number of CHE 6000 credits may be no less than 30)</td>
<td>42</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

- Twelve (12) hours of the OSU core courses (CHE 5123, CHE 5213, CHE 5743 and CHE 5843) -- or have completed courses with equivalent subject matter as part of their M.S. degree program. Students may use up to six hours of OSU core courses (if required) to satisfy an equivalent number of elective or doctoral thesis course hour requirements.
- Six (6) additional hours of graduate-approved elective courses (which may replace six hours of CHE 6000), selected by the student and approved by the student's advisor

Transfer of Credits

For the M.S. degree, a student may transfer a maximum of nine (acceptable) credits. For the Ph.D. degree (following the M.S.), at least 30 credits must be completed at OSU, with no more than nine hours transferred from non-Ph.D.-granting institutions. For students in the direct Ph.D. program, at least 51 hours must be completed at OSU, with no more than nine hours from non-Ph.D.-granting institutions. In all cases, transfer credits must have grades of “B” or better. Decisions regarding the acceptability of transfer credits are made by the student’s Advisor, in consultation with the Graduate Program Director.
Minimum Enrollment

Ph.D. students without a M.S. degree are required to enroll as follows:

First Semester
- Ten (10) credit hours must be taken
- All courses must be in CHE (unless approved by the Graduate Program Directory)
- Courses must include all required CHE core courses offered that semester
- Remedial English (ENGL 0003) may be taken in place of one of the above courses, if necessary (but may not be used to satisfy any graduation requirement)
- One (1) hour of CHE 6010 must be included

Second Semester
- Ten (10) credit hours must be taken
- Courses must include all required CHE core courses offered that semester
- One (1) hour of CHE 6010 must be included

Subsequent Semesters
- At least three (3) hours of CHE 6000 and one (1) hour of CHE 6010 must be taken. This applies to all semesters, including the last semester (or part of a semester) in which the student is enrolled. (In summer sessions, at least two hours of CHE 6000 must be taken; CHE 6010 is not required).
- CHE 6703 (Research Methods in Chemical Engineering) in the third semester
- A minimum of six hours in the fall and spring semesters and three hours in the summer; the specific courses will be determined by the student, with approval of the advisor

Ph.D. students with a M.S. degree from another university are required to enroll as follows:

First Semester
- Ten (10) credit hours must be taken
- Courses must include all required CHE core courses offered that semester (except for previously-completed graduate courses, containing equivalent material, from another university)
- Remedial English (ENGL 0003) may be taken in place of one of the above courses, if necessary (but may not satisfy any graduation requirement)
- One (1) hour of CHE 6010 must be included

Second Semester
- A minimum of six (6) credit hours must be taken
- Courses must include all required CHE core courses offered that semester (except for previously-completed graduate courses, containing equivalent material, from another university)
- Three (3) hours of CHE 6000 and one (1) hour of CHE 6010 must be included
Subsequent Semesters

- At least three (3) hours of CHE 6000 and one (1) hour of CHE 6010 must be taken. This applies to all semesters, including the last semester (or part of a semester) in which the student is enrolled. (In summer sessions, at least two hours of CHE 6000 must be taken; CHE 6010 is not required).
- CHE 6703 (Research Methods in Chemical Engineering) in the third semester
- A minimum of six hours in the fall and spring semesters and two hours in the summer; the specific courses will be determined by the student, with approval of the advisor.

In each of the above categories, exception to the above minimum enrollment requirements can be made to permit a student to carry fewer than 10 hours in the first semester if, upon initial enrollment in the program, the student agrees not to request financial support at any future time while in the Ph.D. program.

**Ph.D. students with a M.S. degree from OSU** are required to enroll as follows:

**All Semesters**

- At least three (3) hours of CHE 6000 and one (1) hour of CHE 6010 must be taken. This applies to all semesters, including the last semester (or part of a semester) in which the student is enrolled. (In summer sessions, at least two hours of CHE 6000 must be taken; CHE 6010 is not required).
- CHE 6703 (Research Methods in Chemical Engineering) in the third semester
- A minimum of six hours in the fall and spring semesters and three hours in the summer; the specific courses will be determined by the student, with approval of the advisor.

**Preliminary Examination**

To qualify for the Ph.D. degree, the student is required to pass the Preliminary Examination. This is in addition to the student scoring a grade of B or better in each of the four ChE core areas during the first year.

- A comprehensive final will be used for the Preliminary Exam in each of the four ChE core areas: CHE 5123, CHE 5213, CHE 5743 and CHE 5843. However, a specialty course may be substituted for one of the four courses, upon approval by the Graduate Advisory Committee.
- Students will be examined in two core subjects in each of two consecutive semesters upon completion of the course. This schedule could change if a specialty course is substituted.
- Each instructor from the core classes administers a comprehensive Preliminary Exam covering the material content of each course, which will be defined in concert with other faculty members with research interests in those core classes. These exams may be scheduled at different times than the final exam of that course or may include the course final exam.
At the end of the semester, each student will be notified by the graduate program coordinator whether they passed the Preliminary Exam. The decision is made by the instructor and faculty members who contributed to the questions on the Preliminary Exam. The score for passing the Preliminary Exam is separate from the score towards the ChE core course grade.

Students who do not pass the Preliminary Exam are allowed to retake the exam one more time during the next exam period (1 year later). However, the decision to allow a student to retake the Preliminary Exam is determined in consultation with the graduate (i.e., dissertation) advisor.

No intermittent exams will be offered. The only exception is for one makeup Preliminary Exam to students passing three core areas. The retake must be scheduled by the instructor and be at least three months after the first Preliminary Exam.

The student must complete the Preliminary Exam prior to completing the proposal Qualifying Examination. Students who do not pass the Preliminary Exam will lose eligibility to continue in the PhD program.

Qualifying Examination

The Ph.D. candidate must complete a qualifying examination no later than the end of the fourth semester of matriculation in the Ph.D. program for candidates holding a M.S. degree, or the sixth semester of matriculation in the Ph.D. program for candidates holding a B.S. degree. This examination will consist of (a) a written proposal regarding the student’s thesis research project and (b) an oral defense of the proposal. The written proposal should conform to National Science Foundation formatting requirements for text, length, bibliography and budget; all other NSF-required documentation is not required. (see the NSF Grant Proposal Guidelines, accessible on the Internet at www.nsf.gov).

The student shall submit a hypothesis-based proposal as prescribed by NSF guidelines
- Advisor may mentor the student in developing the proposal
- Proposal defense includes questions relating to (a) the proposed work, (b) a novel research scenario, and (c) any other topic to assess student’s abilities and prescribe a plan of study
- An evaluation form will be used to assess the student’s performance in proposal development and presentation
- Failure to defend the proposal by the end of the appropriate period will result in loss of funding

In preparation for the qualifying exam, the student must complete CHE 6703, Research Methods in Chemical Engineering, during the third semester in the program.

Public Presentation

A public presentation is required as part of the Ph.D. program. This requirement can be met by (1) giving an oral, full-length seminar as part of the CHE 6010 seminar series, (2) delivering an oral presentation at a professional society meeting, or (3) a similar experience deemed acceptable by the candidate’s Advisory Committee.
This requirement will normally be met as soon as significant research results have been achieved. In the case of an on-campus seminar, the presentation will be made well in advance of the Ph.D. defense. Students wishing to give an on-campus seminar must make arrangements in a manner prescribed by the CHE Graduate Seminar Coordinator.

**Final Dissertation Presentation and Oral Examination**

The defense of the Ph.D. dissertation will culminate the candidate’s Ph.D. program. The candidate must make a public oral presentation summarizing the research work and results. The candidate must schedule his/her dissertation defense with the CHE Graduate Seminar Coordinator (CHE 6010). Usually, the defense will be scheduled during the CHE seminar period, given the availability of the candidate’s Advisory Committee during this time. The candidate will be allotted 20-30 minutes to summarize the objectives, methods, results and conclusions of the research.

Following the candidate’s presentation, both the public and the Advisory Committee members will be permitted to ask questions for a period of time deemed reasonable by the Chair of the Advisory Committee. After the public questioning, the audience will be excused, and the Advisory Committee will pursue any further lines of questioning deemed appropriate. The candidate will then be excused during deliberations of the Advisory Committee. Decisions that the Advisory Committee may reach include, but are not limited to:

1. The candidate has successfully defended the Ph.D. dissertation
2. The candidate must revise the dissertation to the satisfaction of the Examining Committee, with possible reexamination, or
3. The candidate has failed the dissertation defense and is dismissed from the Ph.D. program; alternatively, the Examining Committee may offer the candidate the option to convert to an M.S. degree program.

**Presentation of Research Findings at a National Forum**

The Ph.D. candidate is expected to present his/her findings in a national forum, such as the AIChE or ACS technical conferences. This will help disseminate the research findings to engineering and scientific community and generate useful technical feedback.

**Publication of Research Findings**

The Ph.D. candidate is expected to demonstrate a successful completion of research, as indicated by level of fruition and external acceptance. This may be accomplished by submitting:

- Two manuscripts for publications in refereed journals
- One refereed journal submission may be substituted for by two conference proceedings, or one patent application, or evidence for industrial process implementation.

**Important Links:**

- Graduate College Academic Calendar
  [http://gradcollege.okstate.edu/graduate-college-academic-calendar](http://gradcollege.okstate.edu/graduate-college-academic-calendar)
- Forms
  [http://gradcollege.okstate.edu/FormsPage](http://gradcollege.okstate.edu/FormsPage)
V. THESIS/DISSERTATION RESEARCH ADVISOR

Thesis Dissertation Guidelines

Graduate College provides uniform standards for material included in theses and dissertations that are submitted by graduate students in partial fulfillment of the requirements for masters and doctoral degrees. Visit http://gradcollege.okstate.edu/tdg for more details.

Qualifications necessary to serve as a thesis or dissertation advisor

The Advisor’s primary responsibility is as a mentor. As a result, it is expected that the Advisor will establish the closest working relationship with the student. The Advisor must hold an appropriate OSU Graduate Faculty appointment, but need not hold an OSU faculty appointment if not serving as Chair. The Advisor guides and counsels the student in the research or scholarly effort, ensuring compliance with applicable research regulations. The Advisor serves as the primary resource for the graduate student in identifying potential committee members for the student’s Advisory Committee. The Advisor is responsible for reporting to the Advisory Committee on the student’s progress. It is the Advisor’s responsibility to mentor the student toward a research, scholarly or creative project that is original and worthy of the degree sought. The Advisor is typically involved in the preparation of scientific or creative presentations, manuscripts for publication, etc. which may be a degree requirement in some graduate programs.

Student’s Research Advisor Leaves the Institution: Should a student's Research Advisor leave OSU before the student completes his/her degree, the following steps may be taken after consultation with the Research Advisor and Graduate Program Coordinator:

- For a master’s student or doctoral candidate who need only complete their research project to finish the degree, the student may complete the research project under the direction of the original Research Advisor. If the Advisor is also the Chair of the student’s Advisory Committee, a new Chair would be appointed. The original Research Advisor can continue as a member of OSU’s Graduate Faculty, participate in the student's thesis/dissertation defense, and fulfill his/her obligations to the student.
- For a master’s or doctoral student (defined as not having met the requirements for doctoral candidacy) who is in the early stages of their program and research project, he/she may choose a new Advisor and start a new research project.
- A student may also choose to transfer to the advisor’s new educational institution.

If a student is unable to secure a new Advisor in 30 calendar days, there is no obligation on the part of the program, Graduate College or Oklahoma State University to provide a new one. Without an Advisor the student will not be eligible to continue in the graduate program.

Student-Advisor Relationship: When it is determined that a graduate student and Advisor cannot longer work together, and all efforts for conflict resolution within the program have been exhausted, it is the responsibility of the student to identify a new Advisor or change to another degree option or program. The Graduate Program Coordinator can assist with this process, but Oklahoma State University is under no obligation to provide the student a new Advisor. If a new Advisor cannot be identified in 30 calendar days, the student will no longer be eligible to continue in the graduate program.
Important Links:

- Graduate Faculty Database: https://gradcollege.okstate.edu/faculty-and-staff-resources

- Oklahoma State University Guidelines for Best Practices in Graduate Education https://gradcollege.okstate.edu/best-practices

- Best Practices: Advisory Committees and Defenses https://gradcollege.okstate.edu/best-practices
VI. THE ADVISORY COMMITTEE

Selecting a Thesis Advisory Committee

- Four or more members
  - Chair
    - Administrator for committee, responsible for ensuring that all applicable Graduate College and program rules and guidelines are fulfilled and proper paperwork is filed
    - Must be approved by Graduate Faculty to chair PhD advisory committees (see Graduate College Faculty Database)

The primary responsibility of the Chair of a graduate student’s Advisory Committee is to monitor the progress of the student toward degree completion. The Chair is commonly the research Advisor, but this is not a requirement. The Chair must have a strong familiarity with the academic requirements appropriate to the degree sought. The Chair must hold an appropriate OSU Graduate Faculty appointment, typically a tenure-track appointment in the academic unit in which the graduate degree is housed. The Chair’s duties include convening meetings of the Advisory Committee, as appropriate; ensuring compliance with University and Graduate College policies, procedures and requirements; overseeing the Plan of Study and thesis/dissertation submission processes; and ensuring that the research topic undertaken is appropriate to satisfy degree requirements with the results openly accessible. If the Chair is not also the Advisor, the Chair should serve as a liaison with the Advisor with regard to progress of research in fulfillment of degree requirements.

- Thesis advisor
  - Must be a member of the Graduate Faculty (Graduate College Faculty Database) approved to mentor students

- Expert committee member
  - Must include at least one Expert Member whose expertise and counsel serve the graduate student in attaining the research, scholarly, creative or professional preparation goal that is worthy of the degree sought. Expert Members must hold an appropriate OSU Graduate Faculty appointment. Typically, such individuals are faculty members in the student’s graduate program. An Expert Member’s responsibilities include guiding the research, scholarly or creative activities throughout the process, approving the Plan of Study, reviewing draft documents, attending regular meetings of the Advisory Committee, and interacting regularly with Advisory Committee members to facilitate and monitor degree completion progress.

- Outside member
  - Represents the Graduate College on the advisory committee ensuring the integrity of the processes of the committee
  - Must be an OSU faculty member and member of the Graduate Faculty (Graduate College Faculty Database)
  - Non-OSU faculty members must be approved by the Graduate Faculty (typically requires one to six months to gain approval)
The outside Member serves as the representative of the Graduate College to ensure a high level of integrity in the processes that the Advisory Committee utilizes to review and evaluate the student throughout the graduate program. The Outside Member must be a member of the OSU faculty and Graduate Faculty, but must not be a faculty member from the academic unit or graduate program of either the graduate student, Advisor or the Chair of the Advisory Committee. The Outside Member ensures that appropriate academic standards are applied in evaluating the student, and that the student is dealt with in a fair manner consistent with OSU policies. The Outside member also provides expert advice when appropriate to the student in the conduct of research and writing of the dissertation.

The Advisory Committee will use the written and oral portions of the defense to evaluate the student’s ability to:

- Identify a specific chemical engineering problem (or analyze an existing problem) where research is needed
- Present a defensible rationale for undertaking the research
- Through careful analysis of the problem, establish the current state of knowledge, determine additional knowledge needed to solve the problem, and then summarize this material in logical fashion
- Articulate a testable research hypothesis
- Construct a plan of research to solve the problem and provide sufficient evidence in support of the research hypothesis, including details on the specific methods to be employed
- State clearly the expected outcomes of the research and the value of the results to the profession and to society
- Develop a budget for the proposed work
- Communicate all the above in clear, well-constructed written and oral presentations

The Advisory Committee will use the above information to determine if the candidate is suitable for continuation in the Ph.D. program. Questions regarding the Qualifying Examination should be referred to the Graduate Program Director.

Some decisions that the Advisory Committee may reach include, but are not limited to:

- The candidate has successfully defended the proposal and may proceed with the proposed research program,
- The candidate must revise the examination material to satisfy the Examining Committee, with possible reexamination,
- The candidate must enroll in additional course work prescribed to address particular shortcomings in the candidate’s background, research program or communication skills, or
- The candidate has failed the qualifying examination and is dismissed from the Ph.D. program; alternatively, the Examining Committee may offer the candidate the option to convert to an M.S. degree program
Graduate Committee Meetings
A Ph.D. Student is required to meet with his/her Advisory Committee at least once a year to review the student’s progress in graduate studies:

- The review process will deal with both research and course work requirements
- The student is expected to update the plan of study to reflect the current opinion of the Advisory Committee
- The student will be responsible for facilitating the process
- Failure to meet this requirement will result in blocked enrollment

Important Links:

- Best Practices: Advisory Committees and Defenses: https://gradcollege.okstate.edu/best-practices
- Plan of Study Workshops: https://gradcollege.okstate.edu/pos-workshops
- Plan of Study Portal: http://gradcollege.okstate.edu/planofstudy
- Graduate Faculty Database: http://gradcollege.okstate.edu/faculty-and-staff-resources
VII. PROGRAM MILESTONES

Chemical Engineering MS Milestone Checklist

- Complete online Responsible Conduct of Research module (required prior to enrollment in first semester of graduate studies)
  http://www.gradcollege.okstate.edu/faculty/RCR_grad_students.htm
- Complete online Title IX training, http://1is2many.okstate.edu

Fall Semester

- Complete required core courses
  □ CHE 5743 Chemical Engineering Process Modeling
  □ CHE 5843 Principles of Chemical Engineering Thermodynamics
- Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
- Inform ChE Graduate Coordinator (chegradprogram@okstate.edu) how you are funded
- Research thesis project topic and select thesis advisory committee
  □ Three members minimum
    o Chair/Advisor
    □ Must be a member of the Graduate Faculty (Graduate College Faculty Database) approved to mentor students
    o Two (or more) Members
    □ Represent the Graduate College on the advisory committee ensuring the integrity of the processes of the committee
- Develop Plan of Study (POS)
  □ POS form is available online at the Graduate College website (gradcollege.okstate.edu/planofstudy)
  □ Must be submitted to the Graduate College prior to the end of first semester in order to release the administrative hold to enroll in classes next semester
  □ Make sure you discuss course choices with advisor/chair
- Provide ChE Graduate Coordinator with a copy of POS to verify that it meets ChE requirements
  □ A minimum of thirty (30) semester credits is required by the University for Graduation this requirement is met by the CHE M.S. curriculum
  □ 12 credit hours of CHE Core Courses
  □ Minimum of 3 credit hours CHE 6010 Chemical Engineering Seminar
  □ Maximum of 6 credit hours CHE 5000 MS Thesis
  □ 6 credit hours Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor
  □ 3 credit hours CHE 5990 Special Problems
- Obtain approval signatures on the on-line POS form from the committee members involved and make sure all committee members approve by reminding them
- Complete performance review for the semester
Spring Semester

- Complete required core courses
  - CHE 5123 Advanced Chemical Reaction Engineering
  - CHE 5213 Selected Diffusional Unit Operations
- Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
- Complete performance review for the semester
- Complete Annual Review with advisor

Subsequent Semester(s)

- Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
- Completed performance review for the semester

Graduating Semester of MS study

- Must be enrolled in a minimum of 2 credit hours
- Check deadline dates on Graduate College Calendar for graduation semester
- Submit Draft of Thesis to Graduate College by semester deadline
- Submit Diploma Application
- Complete Graduation Clearance form and give completed to the Graduate College
- Revise POS, if necessary, with Graduate College (complete on-line)
- Complete thesis defense oral presentation
  - Submit thesis copy to the thesis committee at least one week prior to the defense date
  - Present your thesis and the duration for your presentation should be no more than 20 min
  - Chair for thesis defense deliberations will be the senior most faculty member on the thesis committee from the department, other than the advisor
  - After thesis defense, complete the Thesis Defense Results Form with thesis committee obtaining Signatures, submit a copy to the ChE Graduate Coordinator and original to the Graduate College
- Ensure all recommendations from the thesis committee are addressed in the thesis
- Complete the Thesis Approval Template (single white sheet with signatures since thesis is submitted electronically) and file with Graduate College
- Submit final version of thesis online to 1) Graduate College and 2) ChE Graduate Coordinator chegradprogram@okstate.edu before the semester deadline
- Complete ChE Graduation Clearance form (http://che.okstate.edu/node/52 - Graduation Clearance Procedure) and give to ChE Graduate Coordinator.
Chemical Engineering Ph.D. Milestone Checklist

- Complete online Responsible Conduct of Research module (required prior to enrollment in first semester of graduate studies)
  [http://www.gradcollege.okstate.edu/faculty/RCR_grad_students.htm](http://www.gradcollege.okstate.edu/faculty/RCR_grad_students.htm)
- Complete online Title IX training, [http://1is2many.okstate.edu](http://1is2many.okstate.edu)

**Fall Semester**

- Complete required core courses
  - CHE 5743 Chemical Engineering Process Modeling
  - CHE 5843 Principles of Chemical Engineering Thermodynamics
- Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
- Inform ChE Graduate Coordinator ([chegradprogram@okstate.edu](mailto:chegradprogram@okstate.edu)) how you are funded (list below)
- Research thesis project topic
- Pass Qualifying Exams
  - CHE 5743 and CHE 5843 in the Fall
- Complete performance review for the semester

**Spring Semester**

- Complete required core courses
  - CHE 5123 Advanced Chemical Reaction Engineering
  - CHE 5213 Selected Diffusional Unit Operations
- Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
- Pass Qualifying Exams
  - CHE 5123 and CHE 5213
- Develop Plan of Study (POS)
  - POS form is available online at the Graduate College website
    ([gradcollege.okstate.edu/planofstudy](http://gradcollege.okstate.edu/planofstudy))
  - Discuss course choices with advisor/chair
  - Must be submitted to the Graduate College prior to the end of the second semester in order to release the administrative hold to enroll in classes next semester
- Select thesis advisory committee
  - Four or more members
    - Chair
      - Administrator for committee responsible for ensuring that all applicable Graduate College and program rules and guidelines are fulfilled and proper paperwork is filed
      - Must be approved by Graduate Faculty to chair PhD advisory committees (see Graduate College Faculty Database)
    - Thesis advisor
• Must be a member of the Graduate Faculty (Graduate College Faculty Database) approved to mentor students
  o Outside member
    • Represents the Graduate College on the advisory committee ensuring the integrity of the processes of the committee
    • Must be an OSU faculty member and member of the Graduate Faculty (Graduate College Faculty Database)
    • Non-OSU faculty members must be approved by the Graduate Faculty (typically requires one to six months to gain approval)
• Provide ChE Graduate Coordinator with a provisional copy of POS to verify that it meets ChE and Graduate College rules
  - For students with a BS or BA, POS must list exactly 90 credit hours
  - For students with an MS degree, POS must list exactly 60 credit hours
  - BS Degree, minimum of 36 credit hours/MS Degree, minimum 30 credit hours CHE 6000 PhD Research and Thesis
  - BS Degree, 6 credit hours CHE 6010- Chemical Engineering Seminar/MS Degree, 3 credit hours CHE 6010- Chemical Engineering Seminar
  - 12 credit hours of CHE Core Courses if BS Degree or MS Degree not from OSU
  - Sufficient Graduate-approved elective (CHE or other) courses, selected by the student, with approval of the student's advisor to make a total of 90/60 credit hours on the POS
• Obtain approval signatures on the on-line POS form from the committee members involved and make sure all committee members approve by reminding them
• Complete performance review for the semester
• Complete Annual Review with advisor

Second Fall Semester

• Complete required core course
  - CHE 6703 Research Methods in Chemical Engineering
• Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
• Develop research plan
  - Consult with advisor/committee to develop a thesis research proposal
• Complete performance review for the semester

Second Spring Semester

• Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
• Complete research proposal defense
• Submit research proposal copy to the thesis committee two weeks prior to the defense date
• Present your thesis proposal and the duration for your presentation should be no more than 20 min
• After research proposal defense, complete the Research Proposal Defense Results Form with thesis advisory committee obtaining Signatures, provide a copy to the ChE Graduate Coordinator and take to the Graduate College
• Admission to PhD Candidacy
  □ Acceptance of research proposal and passing of comprehensive exam qualifies student for admission to PhD candidacy
  □ Complete Admission to Candidacy form with signatures of thesis advisory committee
  □ PhD Candidates must complete 6 credit hours of graduate studies prior to graduation
• Complete performance review for the semester

Subsequent Semester(s)

• Attend CHE 6010 Graduate Seminar Series (if there is a conflict with another course, make sure you obtain exemption for CHE 6010 from the ChE Graduate Coordinator)
• Present on dissertation project at CHE 6010 Chemical Engineer Seminar by scheduling a time with the instructor of the course (and the advisor/committee)
• Complete performance review for the semester(s)

Graduating Semester

• Must be enrolled in a minimum of 2 credit hours
• Check deadline dates on Graduate College Calendar for graduation semester
• Submit Draft of Thesis to Graduate College by semester deadline
• Submit Diploma Application
• Complete Graduation Clearance form and give completed to the Graduate College
• Revise POS, if necessary, with Graduate College (complete on-line)
• Complete thesis defense oral presentation
  o Submit thesis copy to the thesis committee at least two weeks prior to the defense date
  o Present your thesis and the duration for your presentation should be no more than 20 min
  o Chair for thesis defense deliberations will be the senior most faculty member on the thesis committee from the department other than the advisor
  o After thesis defense, complete the Thesis Defense Results Form with thesis committee obtaining Signatures, submit a copy to the ChE Graduate Coordinator and original to the Graduate College
• Ensure all recommendations from the thesis committee are addressed in the thesis
• Complete the Thesis Approval Template (single white sheet with signatures since thesis is submitted electronically) and file with Graduate College
• Submit final version of thesis online to 1) Graduate College and 2) ChE Graduate Coordinator chegradprogram@okstate.edu before the semester deadline
• Make plans for attending the Graduate College Commencement celebration
• Complete ChE Graduation Clearance form (http://che.okstate.edu/node/52 - Graduation Clearance Procedure) and give to ChE Graduate Coordinator
Annual Review of Graduate Student

Each semester students will be asked to take a survey on their accomplishments and research/scholarly and other creative activities. The data will be compiled, sent to advisors and in the Spring students and advisors will fill out an Annual Review. Areas of strength, areas for growth and development, milestones, and expected progress are discussed during the review.

Important Links:

- Checklist for Doctoral Students: http://gradcollege.okstate.edu/doctoral-checklist
- Checklist for Masters Students: http://gradcollege.okstate.edu/masters-checklist
- Best Practices: Advisory Committees and Defenses https://gradcollege.okstate.edu/best-practices
IX. PROGRAM POLICIES: INTEGRITY IN RESEARCH

CHEMICAL ENGINEERING LABORATORY USE PROCEDURES AND POLICIES

Safety Culture and the Safety Orientation training (recorded sessions featuring EHS) should be taken by all faculty and students conducting research in CEAT laboratories. Directions for enrolling are as follows:
- Logon to D2L (https://oc.okstate.edu/) with your Okey Username and Password
- From your D2L home page, select the "Self-Registration" link at the top of the page.
- Scroll down and select the “STW_CEAT_Safety-General” and/or the "STW_CEAT_Safety-Intro to Safety Culture" link(s) from the list of courses.
- From the "Description" page select "Register" in the bottom right corner of the box.
- Verify that your information is correct in the "Registration Form" box. Then select "Submit".
- The confirmation box will now appear and you are registered for the course. Select "Ok".
- If there are registration questions, contact Jillian Conaghan at jillian.conaghan@okstate.edu.
- Upon successful completion of the course, a certificate will be emailed to the students.
  Forward this email to shelley.potter@okstate.edu

Laboratory Access Procedure

1. All students should read OSU Laboratory Safety Manual. http://ehs.okstate.edu/hazmat/labman.htm, review and sign Safety Contract form. File a copy in laboratory manual where you will be working and bring one to Lab Manager.

2. Visit Environmental Health Sciences Website http://ehs.okstate.edu/modules/hazcom/index.htm
   - Go through the training module and take quiz http://ehs.okstate.edu/tests/Hzcmtest.htm.
   - Print off quiz with score of 80% or better and bring to Lab Manager.

3. Fill out the Safety Video Completion form and bring to Lab Manager.

4. Obtain signature of Lab Manager and take form to Office Manager to obtain lab keys.

Continuous Safety Training

All graduate students - and undergraduate students who are assigned to a laboratory project or desk - are required to attend a "Hazardous Communication Training Seminar" and a “Chemical Engineering Safety Seminar". Attend annual training sessions. These presentations are scheduled as part of the CHE 6010 seminar series. Further, regular safety information is provided throughout the academic year in the form of short presentations or written email bulletins.

Safety Inspection

Regular safety inspections of each laboratory are conducted. The Laboratory Manager and one faculty member comprise the safety inspection team. Graduate students must maintain their laboratories in a condition that will pass this inspection. Any problems in the laboratory will be noted on a safety report form and submitted to the individual student and the faculty advisor charged with responsibility for the equipment or laboratory area. The student is required to confer with his/her advisor and to correct the reported problems, then furnish a report to the
Laboratory Manager. The Laboratory Manager will maintain records of these reports. You are expected to take prompt action to correct any problems.

Labs are inspected randomly by safety representatives from EHS and other outside auditors so it is imperative that the labs are maintained according to the safety directives.

**Posted Safety Procedures**

A set of safety procedures must be posted in each laboratory. If the laboratory you occupy does not have such safety procedures posted (or the posted procedures are out of date), you should immediately contact the professor in charge of that lab and develop a set of safety procedures to post.

**Safety Goggles/Glasses**

State and Federal laws state that all persons (including visitors) are required to wear approved goggles (Type No. 2, USA Standard Practice) in all laboratories in which the following conditions exist:

- Melting, sawing, turning, shaping, cutting, grinding, or stamping of any solid material
- Gas or electric arc welding
- Experiments which involve caustic, acidic, or explosive materials, hot liquids or solids, or injurious radiations
- Other hazards not enumerated

_If, at any time you are in doubt whether goggles are required or not, ask your advisor._ If goggles are required, you are to purchase your own. The laboratory manager will indicate the approved type.

**Laboratories**

The following considerations apply to the operations in our individual two- or four-person laboratories in CHE.

1. **Doors:** You must not cover the windows in the laboratory doors. We respect your desire for privacy; however, your safety is our first concern. In the event of an emergency in your laboratory, a person passing by must be able to see into the laboratory in order to observe the problem through your window and be of assistance.

2. **Security:** The laboratories contain valuable equipment, documents and personal property. Always lock the door whenever you leave the laboratory, **even for a brief period.** Upon the completion of your research program, your key must be returned to the Administrative Support Specialist.

3. **Lights:** The lights in the laboratories should be turned off while laboratories are not occupied, particularly at night. There are, of course, cases where a continual source of light is necessary for the work being conducted.

4. **Visitors:** Your lab is a work/study area and should always be maintained as such. Please do not have guests in the lab while experimentation is underway, others are studying, or if teaching assistance is being given. At no time should several people congregate in the
laboratories to "visit," nor should there ever be any form of "horse-play". Please help us maintain a safe, professional environment in our laboratories.

5. **Windows:** The lab windows should be kept closed at all times for energy conservation and to prevent rain and wind damage to documents, instruments, and the building.

6. **Eating, Drinking and Use of Tobacco in Laboratories:** In all laboratories, eating and drinking is not allowed if chemicals are present.

   *All forms of tobacco use are prohibited* on OSU campus. Everyone is expected to comply at all times with this policy on tobacco use.

7. **Fume Hoods:** The primary purpose of a fume hood is to provide an area where you can handle hazardous materials safely. In some of the laboratories it is necessary to temporarily store chemicals or place an experiment in the hood. There are a few simple rules to follow to ensure that the hoods function properly:
   - When handling hazardous materials, use the area six inches back from the sash,
   - Place all containers two or three inches from back wall, Place large containers in the center of the hood,
   - Keep the sash closed when not in use.

8. **House Cleaning:** CHE follows the policy that students and technicians are responsible for maintaining their own laboratories in a neat and orderly condition. This housekeeping method is employed (instead of the use of custodial services) in order to protect the laboratory equipment and maintain security. When wastebaskets in the lab become full, they should be placed in the hall outside the laboratory for overnight pickup by the janitorial services on Tuesday / Thursday evenings.

9. **Clothing:** No open-toed shoes or shorts should be worn in our laboratories. The question of protection of arms and legs by use of long pants, coveralls, aprons, or other attire must be discussed by each student working in our laboratories with the research project advisor.

**Chemical Inventory**

A current Chemical Inventory should be maintained in the laboratory at all times. As new chemicals are received they should be written on the Inventory and presented to the Lab Manager when monthly laboratory inspections occur. If chemicals are used up and will not be replaced, it should also be noted.

**Handling Chemicals**

As you would expect, chemicals are utilized extensively in our research programs. The following policies are designed to make their use as safe as possible.

1. **Material Safety Data Sheets (MSDS):** You must have one for every chemical in your lab. You must read and understand the MSDS for every chemical you use. MSDS for most chemicals are also kept on file in 421 EN. Before using or transporting any chemicals, you
should obtain the MSDS for that material and read and understand the potential dangers associated with that chemical.

2. **Flammable Chemicals:** Extreme care must be used when working with flammable chemicals. You should always check on the flammability (and toxicity) of any chemical you use -- before you use it. Never heat open containers of flammable liquids over flames or on hot plates. Also realize that the vapors from such liquids can travel across the room and be ignited by sources (electrical plugs and switches, etc.), which are far removed from the experiment. Consult your advisor for appropriate safety procedures to use when dealing with flammable substances.

3. **Transportation of Hazardous Chemicals:** Care and consideration must be given to transporting certain chemicals from laboratory to laboratory or across campus. Pressurized gas cylinders must be moved only on the special dolly designed for this purpose. Cylinders should not be rolled across the floor nor transported in an automobile. If the top valve is accidentally knocked off of a high-pressure cylinder, an uncontrolled rocket will result (even if the pressurized gas is nothing more than air). Of course, the need to carefully transport a toxic substance is even greater. Glass containers of bases, acids, liquid nitrogen, and similar substances are best moved by placing the glass container inside a plastic bucket to minimize breakage and to control spillage in the event of a leak. If you have questions regarding how to move a material, see your advisor or the Laboratory Manager.

4. **Disposal of Chemicals:** The proper disposal of chemical wastes is a major concern to the University. If you have chemical waste material that must be discarded, please consult with the Laboratory Manager for appropriate methods. **Under no circumstances** are you to dispose of chemicals by pouring them down the sinks or drains in the lab or in the restrooms. Chemical wastes should be placed in an appropriate container labelled specifically for disposal purposes. The label is to contain details about the chemical(s) to be disposed. When necessary to be removed, you need to fill out a Chemical Removal Request form obtained by clicking the following link (http://ehs.okstate.edu/hazmat/labman/Chap3d6.htm) and submit to the Laboratory Manager. Our laboratory manager coordinates chemical disposal with the OSU Physical Plant. **Do not leave any unlabeled containers or bottles of chemicals in your laboratory.** These so-called "mystery bottles" can cause considerable concern and expense. When someone moves into your laboratory and finds unlabeled material, a very difficult (and potentially expensive) decision must be made about its contents, use, and disposal.

5. **Gas Cylinders:** Compressed gas cylinders used in the laboratories require special attention and training. Make sure you received training on compressed gas cylinders. Always move the gas cylinders with the caps in place and use the special dolly designed for cylinder transport. Gas cylinders in the laboratory **must always be securely strapped** to a bench, wall, or appropriate structure.

Click on the following webpage for a compressed gas safety module and quiz: [http://ehs.okstate.edu/modules/cylinder/](http://ehs.okstate.edu/modules/cylinder/)
6. **Toxic Chemicals**: Special precautions have to be taken for toxic chemicals. For example, Mercury is a very hazardous chemical. All mercury used in your laboratory work must be checked out from the Laboratory Manager. Should you have any spillage or if any mercury becomes contaminated such that it is not suitable for use, you are to advise the Laboratory Manager at once. No mercury is to be disposed of in any way other than by returning it to the Laboratory Manager.

Hydrogen sulfide is very toxic and demands extreme attention and care. Please inform your advisor and the School Head before you begin any use of H2S. You must arrange to have at least one other person nearby and informed of your use in case assistance is required. In fact, this is a good practice for all experimental operations involving any sort of hazards. A sensing device is available from the storeroom to detect the level of H2S if you are concerned or suspect its presence. Speak with your advisor about the need for a breathing apparatus, continuous monitor, and signs regarding the use of H2S.

Follow similar precautions for other toxic chemicals.

**Equipment**

Most labs will contain significant amounts of valuable equipment for use in experimental research. The following information pertains to the proper use of these items.

1. **Manuals**: For the convenience of all users, operational manuals and instructions are to be maintained with the appropriate equipment and instruments.

2. **Removal of Equipment**: There will be times when you must transfer equipment, instruments or tools from one laboratory to another. Never remove anything from another laboratory without first obtaining approval of the faculty in charge of that particular laboratory and informing the Lab Manager.

3. **Tools**: You may require tools and instruments to conduct your research activities. Some tools are also kept in 421 EN and can be checked out. You are responsible for maintaining the tools and instruments in a satisfactory condition and for their security. The borrowing of tools and instruments without checking with the Laboratory Manager is not permitted. At the conclusion of your research project, you must turn in all tools, equipment and instruments to the Laboratory Manager. Missing items must be paid for or replaced in an appropriate manner.

4. **Maintenance of Equipment and Instruments**: If you have equipment items or instruments in your laboratory under regular use in your research, please see that they are properly maintained. If there is a breakdown or malfunction of any item, you should repair it or have it repaired immediately. Under no circumstances should you have an inoperative item in the laboratory for someone else to come along later and face the problem of repair. Get the item fixed immediately or take it to the Laboratory Manager for repair or disposal.
Graduation Clearance Procedure
To better control the state in which laboratories and equipment are left after graduate students complete their projects, the following clearance procedure is enforced.

- Arrange with your major advisor and the Laboratory Manager for laboratory and/or office inspection
- Turn in keys, equipment, instruments, books, reports and all other borrowed items
- Obtain clearance signatures from the Laboratory Manager, Administrative Support Specialist, and School Head
- Return the ChE Department Graduation Clearance Form to the Laboratory Manager

An indefinite hold will be placed on a student’s graduation until the checkout procedure is completed.

REPORTING ACCIDENTS
Accidents will occur no matter how much care is taken. Find out now how to report any sort of emergency (fire, ambulance, police). Also locate the nearest water safety showers, eyewashes, fire extinguishers, and first aid kits.

To report an emergency, use a regular telephone and dial number 911. In Engineering North, another alternative is to use one of the two yellow emergency telephone boxes located in the center of the 3rd floor hallway and the South end of the 4th floor in the stairwell. These emergency boxes are to be used only for that purpose. Of course fires may be reported by activating the alarm boxes that are located at several points on each floor.

In an emergency you are expected to use some judgment as to the procedures to follow. The faculty in charge of the research in your laboratory must be informed immediately of any accident that occurs, no matter how small. The faculty or School Head should never receive the first information about an accident from an outside source, i.e., the news media or even Safety and Security.

Important Links:
- Academic Calendar:  https://gradcollege.okstate.edu/graduate-college-academic-calendar
- Graduate Student Appeals:  https://gradcollege.okstate.edu/content/appeals-policy
Important Links:

- RCR Core Subject Areas: http://compliance.okstate.edu/rcr/core-subject-areas
- RCR Training: http://compliance.okstate.edu/rcr/training
- RCR Policy: https://stillwater.sharepoint.okstate.edu/Policies/Shared%20Documents/Requirements%20for%20Training%20in%20the%20Responsible%20Conduct%20of%20Research.pdf
- Appropriate Use of Human Subjects in Research: http://compliance.okstate.edu/irb/irb-index
- Appropriate Use of Animals in Research: http://compliance.okstate.edu/iacuc/iacuc-index
- Biosafety Program: http://compliance.okstate.edu/ibc/ibc-index
- Radiation Safety Program: http://compliance.okstate.edu/rso/rso-index
- Laser Safety Program: http://compliance.okstate.edu/lsop/lsop-index
- Professional Society Links Related to Professional Conduct:
X. STUDENT CONDUCT AND APPEALS PROCESS

Dismissal from the Graduate Program

Graduate students may be dismissed from their program for academic integrity violations, student misconduct or behavior that is deemed an egregious violation of professional behavior. In such instances, the student will be informed by the program of the intent to dismiss and their right for due process and to appeal. If a student appeals the decision to dismiss, s/he must be allowed to maintain enrollment and continue working toward the graduate degree in the same manner as any other graduate student in the program during the appeals process. Continued enrollment is not required to appeal. Once the decision of the appropriate appeals panel is made, it will be final.

The purpose of the Appeals Process is to provide current graduate students in the Chemical Engineering Graduate Program the opportunity to resolve complaints about dismissal from the program, placement on probation, recommended denial of readmission to the program, and other administrative or academic decisions that terminate or impede a student’s progress toward their academic or professional degree goals.

The student is required to provide written notification of appeal to the graduate program coordinator within 14 calendar days of the precipitating event that is the subject of the appeal. If the Graduate Program Coordinator is an involved party, the student should seek advice from the unit head or associate dean of graduate studies in their disciplinary college. Notification should include, information on the circumstances of the appeal, specific issues involved, and the remediation action sought. The document should be no more than two pages. Within 7 calendar days of receipt of the notification, any involved parties within the program (e.g., faculty or staff) will be notified and provided a copy of the appeal. The graduate program’s appeals committee will be convened to hear the appeal within a reasonable amount of time, usually 30 days. At the hearing, the student will have the opportunity to present their case and the same time would be allowed for counterarguments, if warranted. Questions may be asked of either party by members of the appeals committee. At the end of this hearing, the program’s appeals committee will deliberate, and their decision will be considered final at the program level. The student will be notified in writing of the decision and their right to appeal to unit head, followed by the Dean of the Graduate College, if they so choose.

Throughout the appeal process the student is allowed to maintain enrollment and continue working toward the graduate degree in the same manner as any other matriculated graduate student in the program. Continued enrollment is not required to appeal within the allowed timeframes.

Unless stated otherwise, all deadlines are by 5:00 pm central time on the day of the deadline or the next regular business day (Monday–Friday) when the deadline falls on a weekend (Saturday–Sunday) or OSU official holiday, such as Labor Day. Time frames and deadlines that extend beyond the end of the academic terms (fall and spring semesters and summer sessions) are handled at the discretion of the Graduate Program Coordinator.