

Chemical Engineering

Dave C. Swalm School of Chemical Engineering

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Graduate study is offered in the Dave C. Swalm School of Chemical Engineering leading to the degree of Master of Science in Chemical Engineering. Two options are available which include the traditional Chemical Engineering program and a program with emphasis in Industrial Hazardous Waste Management. The School also cooperates in an interdisciplinary program leading to the degree of Doctor of Philosophy in Engineering with a concentration in Chemical Engineering. Graduate research assistantships are available. For additional information, contact the Graduate Coordinator (p. 1), Dr. Santanu Kundu at satanukundu@che.msstate.edu.

Admission Criteria

M.S. in Chemical Engineering; Ph.D. in Engineering with Chemical Engineering Concentration

Admission criteria differ based on the graduate degree sought.

Direct Admission to the Ph.D. Program

Cumulative GPA of 3.20 on the last 64 hours of undergraduate coursework

Post M.S. - Ph.D. Program

Cumulative GPA of 3.00 and GRE

M.S. Program

Cumulative GPA of 3.00 on the last 64 hours of undergraduate coursework

International students must have a TOEFL score of 550 PBT (79 iBT) or 6.5 on the IELTS.

For those applicants not possessing a B.S. in Chemical Engineering, admission will be considered on a case-by-case basis. If accepted, those students will be required to complete the required prerequisites and the Chemical Engineering undergraduate core curriculum:

Prerequisites

Calculus sequence plus differential equations

General chemistry (two semesters)

Organic chemistry (two semesters)

Calculus-based physics (one semester)

Undergraduate Core Curriculum

CHE 2114	Mass and Energy Balances	4
CHE 3113	Chemical Engineering Thermodynamics I	3
CHE 3123	Chemical Engineering Thermodynamics II	3
CHE 4113	Chemical Reactor Design	3
CHE 4313	Transport Phenomena	3

Provisional Admission

Provisional admission is typically not available to students applying for graduate admission to the Dave C. Swalm School of Chemical Engineering.

Academic Performance

The Dave C. Swalm School of Chemical Engineering is committed to maintaining high standards for the graduate programs offered by the school. As a means to ensure satisfactory performance of all graduate students enrolled in the school, the guidelines for unsatisfactory performance are given.

- Failure to maintain an overall B average (3.00) in graduate courses attempted after admission to the program
- More than two grades of C in graduate level courses
- A grade of D or F in a graduate level course

- Failure of the qualifying exam
- Unsatisfactory evaluation of a thesis or a dissertation
- Failure to maintain an overall B average (3.00) in prerequisite undergraduate courses
- Official withdrawal from school due to academic difficulties

All students are expected to adhere to these standards. Failure to do so will result in the following actions by the Dave C. Swalm School of Chemical Engineering.

- A student who fails to maintain an overall B average in graduate courses will be given one semester to bring up her/his overall GPA in graduate level courses. If the student currently holds an assistantship from the school, said assistantship may be terminated. The student will be placed on probation for one semester. The graduate level courses taken during this probationary semester must be part of the graduate student's program of study and should constitute a full load. Failure to attain an overall B average in graduate courses at the end of this probationary semester will result in dismissal from the graduate program.
- A student who earns more than two grades below a B, or earns a D or F in any graduate level course will be dismissed from the graduate program of the Dave C. Swalm School of Chemical Engineering.
- A student who officially withdraws from school during the semester due to academic difficulties will be dismissed from the graduate program of the Dave C. Swalm School of Chemical Engineering.

Appeals Process

A student who is dismissed on the basis of academic performance from a graduate program offered by the Dave C. Swalm School of Chemical Engineering may appeal the decision. The appeals procedure is as follows.

- A student may appeal his/her dismissal from a graduate program by submitting a letter of appeal to the Appeals Committee. This letter should contain a detailed explanation of the circumstances leading to his/her dismissal (identified as one of seven points listed in academic performance policy) and should explain any extenuating circumstances leading to failure to maintain satisfactory academic progress.
- The Appeals Committee shall be composed of the following five members.
 - Director of the Swalm School of Chemical Engineering
 - Graduate Coordinator of Chemical Engineering
 - Major professor for the student
 - A professor from another department within the College of Engineering (asked to serve by the Director and/or Graduate Coordinator of Chemical Engineering)
 - Associate Dean for Research and Graduate Studies for the College of Engineering
- The Appeals Committee will review the provided documentation and reach a consensus decision on whether to uphold or overturn the dismissal. If the appeal at the program level is unsuccessful, the student may then appeal to the college dean. If the appeal at the college level is unsuccessful, the student may then appeal to the Provost and Vice President for Academic Affairs.

Accelerated Program

Highly qualified chemical engineering undergraduates (minimum grade point average of 3.5 or higher) in the Swalm School of Chemical Engineering are encouraged to apply to the Accelerated Program. This program permits students to earn up to 9 semester credit hours of graduate-level coursework during their final year of undergraduate studies (or, in exceptional cases, in the junior year, where the student has an exemplary academic record and meets all course prerequisites--e.g. in split-level 4000/6000 graduate courses). When completed successfully, the student will earn both undergraduate and graduate credit simultaneously. Students must meet with a potential graduate advisor to ensure graduate credit could be applied to a program of study for the graduate degree.

Application to this program may be made as early as the middle of the junior year (i.e. after completion of 90 or more hours of graded undergraduate courses.)

Students interested in applying to the Accelerated Chemical Engineering Program should contact either the School Director, Dr. Bill B. Elmore, or the Graduate Coordinator, Dr. Santanu Kundu, for more details.

Entrance requirements are as follows.

- a cumulative grade point average of 3.50/4.00 or higher for all undergraduate work
- a minimum of 90 hours toward the completion of the chemical engineering degree
- completion of the core junior-level chemical engineering courses (i.e. CHE 3213 Heat Transfer Operations, CHE 3123 Chemical Engineering Thermodynamics II, CHE 3223 Separations)
- a statement of professional interests and goals from the applicant

In exceptional cases, where the above criteria are met mid-way through the junior year, the student may take split-level (i.e. 4000/6000) courses in the second semester of the junior year. 8000-level courses are reserved for students in the senior year after completing the equivalent undergraduate

course (e.g. CHE 4134 Chemical Reactor Design taken in a fall semester followed by CHE 8123 Chemical Kinetics and Dynamics taken in the last semester of the senior year).

For students enrolled in an Accelerated Program, the MSU Graduate Council has established the following guidelines in cooperation with the Registrar's Office.

Once the student is accepted into the Accelerated Program, the student and the advisor may select up to 9 hours that will satisfy both undergraduate and graduate requirements. These courses may be split-level (i.e. split 4000-6000 level) or 8000-level classes. The student should take the courses for graduate credit (i.e., 6000-level or higher). The combination of undergraduate and graduate credit hours may not exceed 13 within a semester.

The student should use the Undergraduate Enrollment in Accelerated Degree Program form (<http://www.grad.msstate.edu/forms/pdf/accel.pdf>) to (i) receive from the Office of the Graduate School a level override that enables the student to enroll in the graduate course(s) and (ii) activate a process with the Registrar's Office to obtain both undergraduate and graduate credit for the course. After successfully completing the graduate-level class(es), the Registrar will grant credit for the undergraduate course and give the same grade as received for the graduate course. For the case of a split-level class, the transcript will show credit for both 4000- and 6000-level on the transcript.

Students are permitted to opt out of the Accelerated Program at any time, at which point they could complete only the undergraduate portion of the program. No additional dual counting of courses would occur after the students opted out of the accelerated degree program.

Students are expected to apply to the graduate degree program during the last semester in which they are enrolled in the Bachelor's program.

Application to the graduate degree program would be made through the standard application process via the Office of the Graduate School. Students will receive the Bachelor's degree once the requirements for the Bachelor's degree are met. Students will be required to complete all of the requirements for both the bachelor's and graduate degrees in order to receive both degrees and those requirements will be identical to the requirements for students enrolled in traditional bachelor's and graduate degree programs. Students will be classified as undergraduates until they fulfill all the requirements for the undergraduate degree. At that time, upon admission to graduate school, they will be classified as graduate students and will be subject to all the guidelines pertaining to the graduate degree.

Doctor of Philosophy in Engineering with Chemical Engineering Concentration - Direct Admission

CHE XXXX	Graduate-level coursework	36
Dissertation research/dissertation		20
Total Hours		56

Doctor of Philosophy in Engineering - Post Master's

CHE XXXX	Graduate-level coursework	12
Dissertation research/dissertation		20
Total Hours		32

A student entering with an M.S. from another institution must demonstrate that he/she has satisfied the Chemical Engineering graduate core courses; if not, all or a portion of the 12 hours of core coursework may be required.

Master of Science in Chemical Engineering - Thesis

CHE 8011	Chemical Engineering Seminar	1
Chemical Engineering Core		
CHE 8113	Advanced Chemical Engineering Thermodynamics (Fall)	3
CHE 8123	Chemical Kinetics and Dynamics (Spring)	3
CHE 8223	Advanced Process Computations (Fall)	3
CHE 8523	Advanced Transport Phenomena (Spring)	3
Mathematics/Statistics at the 6000/8000-level		6
Technical electives at the 6000/8000 level ¹		6
CHE 8000	Thesis Research/ Thesis in Chemical Engineering	6
Total Hours		31

¹ Technical electives are chosen in conjunction with the research advisor.

Master of Science in Chemical Engineering - Non-Thesis

CHE 8011	Chemical Engineering Seminar	1
Chemical Engineering Core		
CHE 8113	Advanced Chemical Engineering Thermodynamics (Fall)	3
CHE 8123	Chemical Kinetics and Dynamics (Spring)	3
CHE 8223	Advanced Process Computations (Fall)	3
CHE 8523	Advanced Transport Phenomena (Spring)	3
Mathematics/Statistics at the 6000/8000-level		6
Technical electives at the 6000/8000 level ¹		6
Additional graduate-level coursework		6
Total Hours		31

¹ Technical electives are chosen in conjunction with the research advisor.

Completion Requirements for M.S. Students

All M.S. thesis students must prepare and successfully defend his/her thesis before a committee composed of faculty members of the University. All M.S. thesis students will be required to prepare and submit a manuscript for publication as first author. This must occur prior to the thesis defense. All non-thesis MS students must satisfactorily complete a comprehensive examination.

Completion Requirements for Ph.D. Students

Qualifying Examination

The qualifying exam will consist of two stages: 1) a written comprehensive exam; and 2) an oral comprehensive exam.

1. Written Comprehensive Examination: Students will write a research proposal on the topic of their dissertation research. The deadline for proposal submission will be middle of the third semester (mid-October for Fall admits or mid-March for Spring admits). This will be read and approved by the research Advisor. Once approved by the Advisor, the student will present the proposed research topic to his/her dissertation committee. This constitutes the Oral Comprehensive.
2. Oral Comprehensive Examination: Upon passing the written exam with Advisor approval, the student will orally defend the proposal wither at the end of the 3rd semester or the beginning of the 4th semester. A vote by the dissertation committee will indicate passage of the comprehensive exam.

Successful completion of the comprehensive exam will result in the Ph.D. student being admitted to Ph.D. candidacy.

Publication requirement

Doctoral students will be required to prepare and submit a minimum of two publications prior to the dissertation defense, for which they are first author. One publication must be for a peer-reviewed journal while the other may be for a published conference proceeding.

Dissertation Defense

All PhD students must prepare and successfully defend the dissertation before a committee composed of faculty members of the University.