

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. The School also cooperates in an interdisciplinary program leading to the degree of Doctor of Philosophy in Engineering with a concentration in Chemical Engineering. Prospective students are encouraged to visit the department's website (<https://www.che.msstate.edu>) to learn about faculty research interests and the graduate program.

Admission decisions are made by the graduate affairs committee (GAC) based on the applicant's academic transcripts, a personal essay (statement of purpose), research experience, letters of recommendation, and research interests. GRE scores are recommended but not required. International students must submit TOEFL/IELTS scores. Acceptable score ranges can be found in the Graduate Catalog. Applicants can find additional information on admission requirements and the admission procedure on the graduate school's admissions webpage.

Graduate research assistantships are available. For additional information, contact the Graduate Coordinator, Dr. Neeraj Rai at nr373@msstate.edu. (nr373@msstate.edu)

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

Prerequisites

Calculus sequence plus differential equations

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

**CHE 3113 can be replaced with an equivalent course in Physical Chemistry or Thermal Physics. In place of Transport Phenomena, students can take both Fluid Flow Operation (CHE 3203) and Heat Transfer Operation (CHE 3213). Equivalent courses in Fluid Mechanics and Heat Transfer will serve as a replacement for Transport Phenomena. The Graduate Affairs Committee can waive/add course prerequisites based on student background and preparation.

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

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 admission to all degree programs.

Provisional Admission

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

MS in Chemical Engineering

The program of study of a Master of Science in Chemical Engineering degree includes advanced courses in Chemical Engineering (12 hours), Mathematics & Statistics (6 hours), and elective courses selected based on student's career goals and interests. The MS program includes thesis option and courses-only (non-thesis) option. Students develop their program of study in consultation with the major professor and graduate committee.

Engineering PhD in Engineering with Chemical Concentration

The program of study for a PhD in Engineering with Chemical Engineering concentration includes completion of 56 (post BS degree) or 33 (post MS degree) credit hours in advanced courses in Chemical Engineering (12 hours), Mathematics & Statistics (6 hours), elective courses based on student's research interests (6 hours), and significant scholarly research (20 hours), presented in the dissertation. Students develop their program of study in consultation with the Major Professor and graduate committee. Direct PhD admits would have an option to earn an MS degree upon successfully completing course work (non-thesis) and thesis (thesis-option).

At least 50% of all courses must be at the 8000 (full graduate) level. Furthermore, 50% of courses must be taken at MSU and all thesis/dissertation hours must be taken at MSU.

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 below:

- 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 15 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. See Accelerated Programs (<http://catalog.msstate.edu/archives/2020-21/graduate/colleges-degree-programs/>) for complete information.

In addition to University requirements, Chemical Engineering also requires the following:

- A minimum of 60 hours toward the completion of the chemical engineering degree
- A statement of professional interests and goals

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).

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. Neeraj Rai, for more details.

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.