

# Chemical Engineering

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## Dave C. Swalm School of Chemical Engineering

**Department Director: Dr. Bill Elmore, Interim**

**Graduate Coordinator: Dr. Todd French**

330 Swalm Chemical Engineering Building

Box 9595

Mississippi State, MS 39762

Telephone: (662) 325-2480

E-mail: gradstudies@che.msstate.edu

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. To secure additional information, write to the Graduate Coordinator (p. 1) .

## Admission Criteria

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

Admission criteria differ based on the graduate degree sought. GRE scores are required on the quantitative, analytical, and verbal sections.

#### Direct Admission to the Ph.D. Program

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

#### 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 and GRE

International students must have a TOEFL score of 550 PBT (213 CBT or 79 iBT) or 6.5 on the IELTS.

For those applicants not possessing a B.S. in Chemical Engineering or those coming from institutions that are not ABET-accredited, 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)

Physical chemistry

Calculus-based physics (two semesters)

#### 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 3203	Fluid Flow Operations	3
CHE 3213	Heat Transfer Operations	3
CHE 3223	Separation Processes	3
CHE 4113	Chemical Reactor Design	3

### M.S. Emphasis in Industrial Hazardous Waste Management

The applicant must have a B.S. in an engineering discipline from an ABET-accredited program. Admission criteria requires a cumulative GPA of 3.00 and GRE score.

Requirements for the M.S. with emphasis in Industrial Hazardous Waste Management include 24 hours of coursework, at least 12 hours of which must be at the 8xxx level. A minimum of 6 hours of Thesis/Research is required. The composition of the program of study is flexible, providing the student an

opportunity to select courses in conjunction with the research advisor that allow his/her concentration in a particular area of waste management and/or chemical engineering.

## 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:

- 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 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.

## 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
<b>Chemical Engineering Core</b>		
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 <sup>1</sup>		6
CHE 8000	Thesis Research/ Thesis in Chemical Engineering	6
Total Hours		31

<sup>1</sup> Technical electives are chosen in conjunction with the research advisor.

## Master of Science in Chemical Engineering - Non-Thesis

CHE 8011	Chemical Engineering Seminar	1
<b>Chemical Engineering Core</b>		
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 <sup>1</sup>		6
Additional graduate-level coursework		8
Total Hours		33

<sup>1</sup> 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 non-thesis MS students must satisfactorily complete a comprehensive examination.

## Completion Requirements for Ph.D. Students

### Qualifying Examination

A Ph.D. student in good standing must complete a qualifying exam during the summer semester following his/her first full academic year. The qualifying exam consists of satisfactory completion of a research proposition course in which students will be guided through development of a National Science Foundation-formatted research proposal and a final defense of the proposal in front of a committee composed of University graduate faculty.

### Comprehensive Examination

Upon satisfactory completion of the graduate coursework, or within 6 hours of completion, a Ph.D. student must stand for a comprehensive examination. The student must present to his/her defense committee the results to date and planned research efforts through the completion of the Ph.D. program. This oral comprehensive examination will be comprised of a presentation by the student and a resulting question and answer session; it will provide a measure of the student's research skills and research progress. The comprehensive examination must be passed at least six months prior to graduation. Successful completion of the comprehensive exam will result in the Ph.D. student's being admitted to Ph.D. candidacy.

## **Dissertation Defense**

The candidate must prepare and successfully defend her/his dissertation before a committee composed of faculty members of the University.