

# BSE Chemical Engineering / MSE in Industrial and Operations Engineering SUGS Program

## Introduction and Summary

Description: The Department of Industrial and Operations Engineering (IOE) has established a five-year Sequential Undergraduate/Graduate Study (SUGS) program that allows outstanding students in the College of Engineering (COE) to receive their BSE degree from a participating COE department followed by the MSE degree in IOE after completing a minimum of 152 credit hours. This is accomplished by allowing students to “double-count” **six credit hours** of prior approved graduate-level courses in order to satisfy all requirements for both the BSE and MSE degrees. Double-counted courses appear as transfer credit on the student’s Rackham transcript.

Eligibility: Students who have reached the second term of their junior year with a minimum cumulative GPA of 3.5 may apply for provisional admission to the program. Students pursuing dual degrees are not eligible to enroll in SUGS programs. This allows sufficient time for the student to be advised appropriately regarding undergraduate and graduate course selection. Students who do not meet the GPA requirement may petition the IOE Graduate Admissions and Financial Aid Committee for provisional admission by providing other credentials such as a letters of recommendation from faculty and/or other evidence of special accomplishments. Finally, the student must include a nomination letter from his/her Undergraduate Program Advisor as part of the SUGS application.

Tuition Requirements: SUGS students must enroll in Rackham for at least two full terms, paying Rackham tuition. Normally, this will be the final two terms of enrollment in the five-year program.

## Background

There are several reasons why chemical engineering students pursue the IOE Masters degree. Some students use it as the first step toward the IOE Ph.D. degree. Other students pursue the degree to expand their knowledge base in order to enhance their qualifications for professional engineering careers. Among this group, most students select their IOE courses in order to specialize in one or two of the following areas:

- Analytics and Operations Research
- Data Science
- Healthcare Engineering
- Human Systems Integration
- Operations Engineering
- Quality Engineering

The BSE/MS-IOE SUGS program encourages some of our very undergraduates to stay at Michigan for an extra year. It also serves the engineering community by providing better-trained engineers at the entry level of the profession.

## Program Description and Degree Requirements

### Requirements for the BSE Degree

SUGS students must complete all requirements for their BSE degree as established by their department and published in The University of Michigan College of Engineering BULLETIN. It is recommended that students complete IOE 265 “Engineering Probability and Statistics” (3 credit hours), IOE 316 “Introduction to Markov Processes” (3 credit hours), and IOE 366 “Linear Statistical Models” (3 credit hours). Because these courses are at the undergraduate level, they are NOT eligible for double counting, but may be used as engineering electives toward the BSE ChE degree. (Note: Courses equivalent to IOE 265, 316, and 366 are acceptable to fulfill probability and statistics preparation.) Up to six credit hours of undergraduate courses may be “double-counted” and transferred to the student’s Rackham transcript, *provided that these courses are eligible for credit in the IOE Masters degree curriculum*. Normally, double-counted courses are selected from the “General Elective” category of the BSE degree requirements. *Additional information on eligible graduate courses can be found at:*

<https://ioe.engin.umich.edu/graduate/masters-program/masters-programs-curriculum/masters-program-requirements/>

*An important exception is Accounting 471. Although this class is open to undergraduate and graduate students, graduate students are required to do additional work. Therefore, Rackham does not automatically allow transfer credit for Accounting 471 if the course is taken while enrolled as an undergraduate. To receive transfer credit, the student must also get a memo, or email from the instructor indicating they did graduate level work. They should include this memo with their SUGS paperwork. Students considering the SUGS program should work closely with Brittany Smith from their BSE department as well as the IOE SUGS Advisor when choosing elective courses. Any student wishing to enter the SUGS program must include a nomination letter from his/her Undergraduate Program Advisor as part of the Rackham application.*

### Requirements for the MSE (IOE) Degree

SUGS students must complete 30 credit hours of approved graduate-level courses in order to receive the MSE (IOE) degree. These include;

- At least 18 hours of approved IOE graduate courses
- At least 14 credits at 500-level or above (minimum of 12 credits from IOE)
- The Independent study IOE 590 may be used for at most 3 credit hours of the required 12 credit hours of IOE courses at the 500 level or above
- No more than six credits of independent study, or project-based courses
- At least one cognate course (equal or greater than 3 credits) must be taken from outside the IOE department

Information regarding which 400-level and 500 level courses are eligible for IOE graduate credit is summarized on the "Masters Counseling Information" <https://ioe.engin.umich.edu/graduate/masters-program/masters-programs-curriculum/masters-program-requirements/>

Other questions regarding the eligibility of courses will be answered by the IOE Graduate Program Advisor.

**The key to designing a SUGS program that can be completed with the minimum 152 credit hours is careful management of undergraduate elective courses. Students considering the SUGS program must "reserve" at least 9 credit hours for undergraduate probability and statistics coursework and 6 elective credit hours for courses that are eligible for credit in the IOE Masters degree program.**

### **CONTACTS**

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Rackham SUGS website:

<http://www.rackham.umich.edu/current-students/policies/academic-records/sugs-information>

*See Sequential Undergraduate/Graduate study (SUGS) Programs for ChE Students handout for more info regarding how SUGS works.*

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