

# **BSE Chemical Engineering / MSE in Macromolecular Science and Engineering SUGS Program**

The SUGS program is an integrated program that facilitates the completion of a master's degree with two semesters of study beyond the bachelor's degree. Up to nine hours of required course work can be double counted within the combined program. These will typically include the six credits of technical elective, and either free elective credits or the biology/life science elective. Students pursuing dual degrees are not eligible to enroll in SUGS programs.

The general requirements for all Macromolecular Science and Engineering Masters programs is 30 credit hours: 9 of these from Macromolecular Science and Engineering courses and 9 more from specialization courses, and 12 hours of graduate credit. There are several specializations or options from which to choose: Biomaterials Engineering, Biomedical Engineering, Chemical Engineering, Chemistry, (Synthetic or Physical), Materials Science and Engineering, Organic Electronics and Photonics, and Physics.

It is recommended that in all the options an introductory course such as Macro 412 / MSE 412 be taken as part of these credits by all students who do not have a strong polymer background.

## **Biomaterials Engineering Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Biomaterials Engineering and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 412 or 512, 538, and graduate courses in biomaterials, biochemistry, and biophysics.

## **Biomedical Engineering Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Biomedical Engineering and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 412 or 512, 538, and a graduate course in biomaterials, biochemistry and/or biophysics, in addition to courses in biomedical engineering.

## **Chemical Engineering Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Chemical Engineering and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 412 or 512, 538, and graduate courses in transport phenomena, numerical methods or mathematical modeling, and polymer processing.

## **Chemistry Option (Synthetic or Physical)**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Chemistry and 9 hours in Macromolecular Science and Engineering. For the Synthetic option, these courses should include: Macro 412 or 512, and 538. Additionally, students will select two courses from the following: Chem 507, 511, 518, 536, 540, and 543. For the Physical option, courses should include: Macro 412 or 512, Macro 538, Chem 571, 576, and 580.

## **Materials Science and Engineering Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Materials Science and Engineering and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 412 or 512, and 538.

## **Organic Electronics and Photonics Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in the field of Organic Electronics and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 412 or 512, 538, and graduate courses in device physics, device applications, and device fabrication.

### **Physics Option**

A minimum of 30 hours of course work must be elected, including at least 9 hours in Physics and 9 hours in Macromolecular Science and Engineering. These courses should include Macro 538 and a graduate course in physical properties of polymers. Students will select two courses from the following: Physics 505, 506, 510, 511, 512, 520, 540, and 541.

### **Application information**

To officially enter the SUGS program, a chemical engineering student must have a minimum of 85+ hours at the time of entry and a 3.5 GPA. Students considering this program should make an appointment with the Macro Program Coordinator to discuss this program and ensure that it is a good fit with their career goals and plans. Application materials should be submitted to the Rackham Graduate School, and will be reviewed by Macromolecular Science and Engineering faculty. The application deadline for fall term admission is January 15<sup>th</sup>.

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.

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

### **CONTACTS**

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Macromolecular Science and Engineering website:

<http://macro.engin.umich.edu/>

Rackham SUGS website:

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