

# **BSE Chemical Engineering / MSE Biomedical Engineering – Biotechnology Concentration**

## **SUGS Program**

### **Introduction**

What is Biomedical Engineering (BME)? It's a synthetic heart valve that saves a grandmother's life. It is a MRI scanner that reduces parents' worries about their infant's head injury. It's an automatic biosensor for rapid gene sequencing. Biomedical engineering is the newest engineering discipline, integrating the basic principles of biology with the tools of engineering. With the rapid advances in biomedical research, and the severe economic pressures to reduce the cost of health care, biomedical engineering will play an important role in the medical environment of the 21<sup>st</sup> century. Over the last decade, biomedical engineering has evolved into a separate discipline bringing the quantitative concepts of design and optimization to problems in biomedicine.

The 5-year sequential undergraduate/graduate study (SUGS) program in biomedical engineering combines an undergraduate engineering discipline with a graduate program in one of the fastest growing fields in engineering. At the end of the program, a student has a B.S.E. in Chemical Engineering and an M.S.E. in Biomedical Engineering with a concentration in Biotechnology.

### **Opportunities**

The opportunities for a biomedical engineer are wide ranging. The medical device and drug industries are increasingly investing in biomedical engineers. As gene therapies become more sophisticated, biomedical engineers will play an important role in bringing these ideas into real clinical practice. Finally, as technology plays an ever-increasing role in medicine, there will be a larger need for physicians with a solid engineering background. From biotechnology to tissue engineering, from medical imaging to microelectronic prosthesis, from biopolymers to rehabilitation engineering, biomedical engineers are in demand.

### **Application information**

To officially enter the SUGS program a Chemical Engineering student must have obtained senior standing (85+ hours) by the time of entry and have a GPA of 3.2 or above. Students may apply for provisional admission Winter of their Junior year. To apply, first make an appointment with Ms. Rachel Patterson, BME Academic Advisor/Counselor, to discuss this program and ensure that it is a good fit with your career goals and plans. A student may also be referred to a faculty advisor for further services.

The application deadlines are:

To begin SUGS in Fall term –  
U.S. & Canadian students apply by July 1, International students apply by June 1

To begin SUGS in Winter term –  
U.S. & Canadian students apply by Nov. 1, International students apply by October 1

To begin SUGS in Spring term –  
U.S. and Canadian students apply by March 1, International students apply by March 1

In the spring term, very few course offerings are available. Most students will be better served by entering the program in the Fall or Winter terms.

Students in the SUGS program are not eligible for a Life Sciences concentration in BSE ChE. Students pursuing dual degrees are not eligible to enroll in SUGS programs.

## COURSE LIST and REQUIREMENTS

[http://bme.umich.edu/wp-content/uploads/2018/06/BME\\_Graduate\\_Curriculum\\_F18.pdf](http://bme.umich.edu/wp-content/uploads/2018/06/BME_Graduate_Curriculum_F18.pdf)

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

## CONTACTS

Undergraduates:

Dr. Susan Montgomery, 3142 Dow, (734) 936-1890, smontgom@umich.edu  
<http://www.che.engin.umich.edu/graduate/program/sugs/>

Graduate:

Prof. Zhen Xu, 2115 Gerstacker Building, (734) 647-4961, zhenx@umich.edu  
Ms. Rachel Patterson, 1111 Gerstacker Building, (734) 763-5290, rjpatt@umich.edu  
<http://www.bme.umich.edu/programs/SGUS/>

Rackham SUGS website

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