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 21st 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 Mrs. Susan Graeber, 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.

Next, fill out a Rackham Graduate School application and attach a statement of purpose, personal statement, and resume online. The application is submitted to the Rackham Graduate School and the Department of BME. The three names and email addresses of the faculty who will be writing letters of reference for you should be noted at the end of your online application. When your application is submitted, the system will send an email to the faculty with instructions on how to complete the form and letter of reference on-line. General Record Exam (GRE) scores are not required. The graduate school application fee must be submitted to Rackham, as well. Admission is not automatic. The BME admissions committee will review your application. Your statement of purpose and letters of recommendation are important parts of the admission decision.
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.

GRE scores are not required for admission to the SUGS program, but are required for admission to the regular BME master’s and Ph.D. programs. If a student is seriously considering pursuing a Ph.D., the GRE test should be taken during the senior year. This also facilitates applications for major national graduate fellowships from the National Science Foundation, Office of Naval Research, Whitaker Foundation and others. The TOEFL is waived for students who have already taken it.

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.

Requirements

1. All 128 credits of Chemical Engineering BSE requirements must be met.
2. All 30 credits of Biomedical Engineering MSE requirements must be met.
3. Up to nine hours of prior-approved coursework may be double-counted towards each of the two degrees, leading to a minimum total of:

   \[128 \text{ (BSE)} + 30 \text{ (MSE)} - 9 \text{ (double-counted)} = 149 \text{ credit hours.}\]

Double-counted hours may not include any core courses required for the BSE degree, but may include courses elected to meet technical, biology/life science or free electives required for the BSE degree.

All double-counted hours must be acceptable for Rackham credit (non-core BME 4xx or BME 5xx or BME 6xx courses, or courses in other departments at the 4xx level or above). Check the Rackham approved courses online at [http://www.rackham.umich.edu/programs-of-study](http://www.rackham.umich.edu/programs-of-study) in the Graduate Courses section on the right.

COURSE LIST and REQUIREMENTS


CONTACTS

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

Prof. Zhen Xu, 2115 Gerstacker Building, (734) 647-4961, zhenx@umich.edu
Mrs. Susan Graeber, 1111 Gerstacker Building, (734) 763-5290, sbitzer@umich.edu
http://www.bme.umich.edu/programs/SGUS/

Rackham SUGS website
http://www.rackham.umich.edu/current-students/policies/academic-records/sugs-information
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