University Senate

Proposed: April 1, 2016

Adopted: By voice vote with no abstentions

RESOLUTION TO ESTABLISH A
B.S./M.S. IN BIOMEDICAL ENGINEERING (SEAS)

WHEREAS, the Fu Foundation School of Engineering and Applied Science prepares talented students to become innovative, socially responsible leaders in industry, government and academia, and

WHEREAS, the Bureau of Labor Statistics estimates that ten years from now, demand for biomedical engineers will have grown some 27 percent, and

WHEREAS, biomedical engineers are increasingly needed in medical research and the medical device industry, and a degree in biomedical engineering can serve as a preparation for medical or dental school, and

WHEREAS, employers of engineers frequently favor applicants with qualifications beyond the bachelor of science degree, and

WHEREAS, the proposed program will help Columbia retain talented engineers who wish to pursue advanced degrees, and

NOW, THEREFORE, BE IT RESOLVED that the Senate approve the B.S./M.S. in Biomedical Engineering at the Fu Foundation School of Engineering and Applied Science (SEAS), and

BE IT FURTHER RESOLVED that the Education Committee review the program in five years.

Proponent:

Committee on Education

1) Purpose

A) Describe the purpose of the proposed program and the professional and educational assumptions that underlie it.

The purpose of the BS/MS program in Biomedical Engineering (BME) is to provide undergraduate students in BME at Columbia the opportunity to obtain their Bachelor of Science and Master of Science degrees in an integrated fashion. Specifically, two required undergraduate courses (6 pts), BMEN E4001 and E4002, will double count toward the student's BS and MS degrees. Additional benefits of this program include optimal matching of graduate courses with the corresponding pre-requisites, greater ability to plan ahead for optimal course planning, and a simplified application process (no GRE required). In addition, employers are now favoring applicants with the additional education and experience implied by the MS degree. By merging the programs, we can provide the students with both degrees in the most efficient manner.

B) Discuss how the proposed program furthers the mission and plans of the department or school.

The mission of Columbia Engineering, The Fu Foundation School of Engineering and Applied Science at Columbia University in the City of New York, is to prepare talented students to become innovative, socially responsible leaders in industry, government, and academia. This integrated BS/MS program will provide students with additional education and experiences such that they are prepared to be leaders in their chosen field.

C) Discuss the relationship of the proposed program with the other curricular offerings of the school. Will it replace or duplicate, in full or in part, any existing program?

The proposed program will supplement the current training for undergraduate students in Biomedical Engineering with additional training and coursework at the graduate-level. This training will be identical to the current program for an MS in Biomedical Engineering, with the exception of reduced MS program requirements to 24 pts due to integration of 6 points with the BS degree.

2) Need

A) Describe the need that the proposed program is designed to meet.

Employers are now favoring applicants with additional education and experience. Continuing on to an MS degree program at Columbia University will provide undergraduates an opportunity for advanced training and education in an efficient manner. Specifically, students will have the advantages of having the exact prerequisites for advanced courses, of reducing the MS degree requirements to 24 pts, and of being at an institution and city they already know. Approximately 1/3 of our undergraduate students go to graduate school, 1/3 go to medical school, and 1/3 seek employment in industry, consulting, and other areas. The proposed program will help us retain our best undergraduate students who are interested in

graduate school. According to the Bureau of Labor and Statistics, the 10-year job growth projection for Biomedical Engineers is +27%.

B) Have you received requests for the program? If so, describe the reasons for those requests and who made them.

N/A

C) Do other institutions in the metropolitan area and in the Northeast offer similar programs? If so, describe how the program differs from those at the other institutions.

This integrated BS/MS program is already offered by two Departments (MECE and EE) within the Fu Foundation School of Engineering and Applied Science. Our program differs from these programs in that we specify exactly which courses (BMEN E4001 and BMEN E4002) will double count toward both degrees while the other programs allow students to use 6 pts worth of any technical electives.

3) Curriculum

A) Provide a brief summary of the program.

The BS/MS degree program is open to a qualified group of Columbia juniors and makes possible the earning of both the BS and MS degree in an integrated fashion. Benefits of this program include the matching of graduate courses with the corresponding pre-requisites, a greater ability to plan ahead for optimal course planning, and a simplified application process with no GRE required. Up to 6 points from the BS degree requirements, specifically BMEN E4001 and E4002, will also count towards fulfilling the Master of Science degree course requirements. To qualify for this program, students must have a cumulative GPA of at least 3.5 and strong recommendations from within the Department. Students should apply for the program by April 30th in their junior year.