Mission Statement
The mission of the Biomedical Engineering graduate program is to educate M.S. and Ph.D. students to become the next generation of innovators in biomedical research and scholarship. This mission directly supports the University goal of cultivating excellent graduate programs and advancing research and scholarly enterprise as described in “The Iowa Promise” University strategic plan for 2005-2010. The overall vision of the Department is to become recognized as one of the top ten biomedical engineering graduate programs at public universities in the United States.

Admissions Process and Criteria
The student demand for the Graduate Program in Biomedical Engineering has been high over five-year reporting period from 2004-2008. The program averages 147 applications per year, with about 30% being admitted, 70% of whom matriculate into the Program. Students are admitted based upon a review of GPA, GRE and TOEFL (for foreign student) scores, the applicant’s statement of purpose and recommendation letters. Minimum admission requirements are an undergraduate GPA greater than 3.0 for MS students, a combined undergraduate and graduate GPA greater than 3.25 for PhD students, GRE scores (verbal + quantitative tests) greater than 1250, and a TOEFL score greater than 250 (computer-based), 650 (paper-based), or 100 (internet-based) for non-native English speakers. The final admissions decision relies on the evaluation of the student application materials by the BME Faculty, with particular attention to the student’s personal experience and motivation for entering graduate studies. Well-qualified undergraduate students may apply to enter a combined BS/MS “fast-track” degree program in the fall semester of their senior year. If accepted, fast-track students enter the graduate program in the spring semester of the senior year, and immediately begin coursework and research toward the MS degree.

The average GRE score of entering graduate students in the Program over the reporting period has been higher than the national averages for both Biomedical Engineering graduate programs and all Engineering graduate programs combined. This average GRE score is also higher than the average GRE of all University of Iowa graduate programs, thus indicating the quality of students in the program. Success in enrolling a diverse student cohort can also be found in various other statistics: the ratio of domestic students to foreign students has been about 50% in every semester in the reporting period. On average, about 50% of the students are female, and about equal fractions of students are Caucasian, Asian, and Asian-Indian. The Program has also been an active participant in the AGEP Program, although African-American enrollment in graduate Engineering programs is typically quite low, even at the national level, and the BME Graduate Program has only about 2% African American students.

Graduate student support is provided through a mix of research assistantships (RA), teaching assistantships (TA), and some fellowship awards. For each semester in the reporting period, about 80% of the students were supported
through RA and TA appointments at 25-50%, with TA appointments constituting about 25% of these awards.

**Program Characteristics**

*Size / Productivity / Honors*

Over the reporting period, the Graduate Program in Biomedical Engineering current had, on average, about 76 students (about 33 M.S. / 43 Ph.D.). Currently, the Department has about 14 primary faculty, taking into account several jointly appointed faculty members, yielding about 5.4 graduate students per full-time faculty position. The Program is further bolstered by the involvement of about 28 secondary and adjunct faculty, most of who participate in graduate student training. Nearly every graduate thesis research project is multi-disciplinary, often addressing problems that combine engineering with the basic sciences, medicine, nursing, public policy, and public health. Further, the involvement of the BME faculty as members of the Iowa Institute for Hydrosience Research, the Center for Computer-Aided Design, the Iowa Institute for Biomedical Imaging, the Coordinated Center for Computational Biology, and the Cancer Center serve to further enhance the opportunities available for graduate students in the Program. Overall, the BME faculty considers the size of the Program to be appropriate for the current number of faculty.

The Program continues to strive to increase high quality domestic graduate student enrollment. We have made progress in recent years through the development of a Graduate Scholar Program funded by the Graduate College's Strategic Initiative Fund. This program provides support for outstanding students during their first year of graduate study, and is designed to allow the Program’s scholars to become familiar with the large variety of research programs affiliated with the Department. Over the past reporting period, BME graduate students have produced, on average, about 3.5 peer-reviewed publications per student. About 70% of the students have received honors and awards for outstanding scholarship, usually through the selection of awards for best presentations or papers at national conferences. About 25% of our students receive some form of competitive fellowship award during their tenure as graduate students.

**Program Comparisons at the National Level**

In 2009, U.S. News and World Report ranked the program 43rd amongst all U.S. Biomedical Engineering graduate programs, and 19th amongst public universities. The mean time to degree for PhD students in the Program also compares favorably at the national level, with a mean time to degree (TTD) of about 4.8 years during the reporting period of 2005-2008, vs. historic trends nationwide of about 8 years for Engineering Ph.D.’s. This TTD value also places the Program among the upper echelon of UI graduate programs. The graduate faculty in the Program continue to be competitive in research funding at the national level, and have recently been awarded a T32 training grant from the NIH in the area of Bioinformatics. During the academic year 2007-2008, the program presented about $7.8 Million in research expenditures (approximately $557K/FTE), placing it 5th in the Big 10 in this category.
Other Factors / Areas for Improvement

The undergraduate program in BME continues to grow, with about 300 undergraduate BME majors, due in large part to the overall growth trend in this field. This growth of the undergraduate program has positive and negative consequences. Some of our best undergraduate students enter the graduate program, are immediately productive in research and are thus successful M.S. and Ph.D. students. However, the rather large undergraduate student to faculty ratio sometimes has a negative impact on primary faculty research programs. If the growth at the undergraduate level continues, challenges will certainly arise in continuing the growth of the graduate program.

Although the Program is selective with regards to graduate student acceptance, the main limiting factor has been the availability of student support. Each year, the program loses excellent potential students due to the lack of financial support. A newly developing trend is that some students elect to enroll without a firm commitment of support. Although this speaks well of the graduate education in the Program, it is less than satisfactory. A major goal for our program is to achieve 100% support for our graduate students (including full tuition support).

The Program’s stated goal is to increase our national ranking towards achieving a position in the top ten Biomedical Engineering graduate programs in public universities nationwide. There are obstacles towards reaching this goal, as most universities in the upper echelon have considerable endowed support, and the Program has essentially no endowed support. Although the faculty have considered pursuing strategies related to establishing endowed support, it is likely that further increases in the Program’s national ranking will be obtained chiefly through increased extramural research support derived from grants and contracts. Thus, to further enhance the Program it is essential that the Program faculty aggressively pursue increases in research funding.

Conclusions

The Graduate Program in Biomedical Engineering continues to strive to improve its graduate student productivity, contribute to the success of its graduates, and improve its national rankings. We are moving towards our goal of joining the top ten of all Biomedical Engineering graduate programs at public universities, and are making progress in providing full support for all graduate students in the program. Graduate students in the program work hard and have achieved high levels of productivity. The Program faculty has made a strong effort to reduce the time to degree for PhD students in the Program. At this time, the size of the program is probably optimal for the resources available. The greatest challenge towards the continuing growth and improvement of the Program is to determine mechanisms to support further growth of graduate faculty research programs in the face of increased undergraduate student enrollment, reduced institutional support, and decreases in faculty numbers. If these problems can be overcome, it is considered likely that the Program will continue in an upward trajectory towards achieving its goals.