

# **Graduate Program in Biomedical Engineering**

## **Ph.D. Degree Learning Goals and Assessment**

The joint Rutgers University Graduate School of New Brunswick (GSNB) and Graduate School of Biomedical Sciences (GSBS) doctoral program in Biomedical Engineering provides outstanding training in critical areas of Biomedical Sciences that span research thrusts of Biomaterials and Tissue Engineering; Biomechanics and Rehabilitation Engineering; Computational Bioengineering and Biomedical Imaging; Molecular & Cellular Bioengineering; Nanomedicine; NeuroEngineering; and Physiological Systems and Bioinstrumentation.

### **Learning Goal 1 for Students: Attain marked ability, scholarship, research, and practical skills concerning factors that contribute to areas within Biomedical Engineering**

Assessment of graduate student achievement of Goal 1:

- Grades in graduate courses
- Written and oral qualifying examinations assessing ability to think critically, integrate knowledge and understanding, and communicate
- Formal, required annual reviews by faculty advisors and/or committees to gauge student progress – Due by every August 15<sup>th</sup>.
- Professional conferences attended; abstracts, journal articles submitted
- Placement in positions and careers that require ability and scholarship in those research thrusts in Biomedical Engineering

Role of the graduate program in helping students to achieve Goal 1:

- Close tracking to assure that students are being prepared in a coherent and academically rigorous fashion by using new Google Tracking Survey
- Effective monitoring of student progress
  - Includes annual reviews on research progress from the student's advisor and committee
- Evaluations of teaching effectiveness of instructors in graduate courses
  - If effectiveness is below program expectations, work with instructors to improve course content
- Periodic review of curricular offerings, degree requirements and assessment tools
  - By graduate program executive committees
  - By BME faculty during annual retreat
  - By the BME Industrial Advisory Board during the annual IAB meeting
  - In consultation with the Bioengineering Student Society
  - In consultation with the Graduate Schools of Rutgers-New Brunswick and Graduate School of Biomedical Sciences and School of Engineering

### **Learning Goal 2 for Students: Engage in and conduct original research**

Assessment of graduate student achievement of Goal 2:

- Preparation and defense of Ph.D. dissertation proposal
- Assessment of quality of Ph.D. dissertation:
  - Public defense of dissertation
  - Critical reading of dissertation by committee of graduate faculty members and a committee member from outside of the Biomedical Engineering graduate program.

- Achievement of students as evidenced by professional placements, selection for conference presentations, peer-reviewed publications and individual grant attainment

Role of the graduate program in helping students achieve Goal 2:

- Provide early introduction to research methods and opportunities for research
  - Mandatory first-year rotations, including preparation of “White Paper” in conjunction with the Writing Seminar professional development course
- Provide opportunities to present research and receive feedback through required BME Professional Development courses and seminars
- Assist in maintaining adequate funding levels through the research phase
- Provide comprehensive advising and assist in the identification of mentors

**Learning Goal 3 for Students: Prepare to be professionals in careers that require training at the highest levels in areas within Biomedical Engineering**

Assessment of graduate student achievement of Goal 3:

- Review evidence of papers presented, publications and professional networking
- Evaluations of teaching effectiveness of graduate student instructors
- Collection of placement data
- Meet each semester with the Bioengineering Student Society
- Review by external advisory committees, both inside of and external to the academy
- Survey alumni/ae
- Participating in iJOBS and using IDP’s (Individual Development Plans)

Role of the program in helping students achieve Goal 3:

- Mandatory enrollment in the professional development course Preparing Future Faculty I and II to provide opportunities to teach
- Mandatory enrollment in the professional development course Clinical Practicum
- Host discipline-specific Seminars of external faculty in Biomedical Engineering
- Teach students how to do assessments in their future professional capacities
- Provide flexible options for students with interdisciplinary interests related to Biomedical Engineering
- Develop or enhance programs related to job and networking skills, including activity in professional societies and preparation for necessary certifications
- Provide opportunities to mentor undergraduate projects through Senior Design, BME Honors Academy, independent study, and summer ‘REU’ programs

**The leadership of the Biomedical Engineering graduate program** will regularly review the structure and content of the doctoral program and the feedback received from assessments and surveys. These reviews will be used to provide the best possible education to students in order to meet the needs for highly trained individuals in the Biomedical Sciences fields.