

BIOMEDICAL ENGINEERING (PH.D.)

Program specialization in this Ph.D. degree may be undertaken in these areas: biomaterials and tissue engineering, biomechanics of injury, biomedical imaging, biomedical instrumentation, computational and systems biology, and interdisciplinary. These specializations are available to both part-time and full-time students.

Admission Requirements

Admission to this program is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). In addition, the minimum requirements for admission into the Doctoral Program in Biomedical Engineering are:

1. A student seeking admission to the doctoral program must have a Bachelor's or Master's degree in Biomedical Engineering, or other closely related fields from an accredited institution. Official transcripts from an accredited institution showing completion of a baccalaureate degree must be included. Students with a baccalaureate degree from a non-engineering discipline will be considered for admission to the program if they have the prerequisite coursework in Calculus (1, 2, and Differential Equations) and Physics (1 and 2). Applicants are expected to have some background in a programming language (e.g. MATLAB, C, C++, Java, Python, R, FORTRAN, etc). Courses from online platforms such as Coursera (<https://www.coursera.org/>), EdX (<https://www.edx.org/>) and MATLAB Onramp | Self-Paced Online Courses - MATLAB & Simulink (<https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted/>) may be used to gain such knowledge. Students without subsequent mathematical application coursework (e.g. life science) must have passed these courses with a grade of 'B' or better.
2. A GPA of at least 3.5/4.0 in the applicant's Bachelor's degree or a GPA of at least 3.3/4.0 in the applicant's Master's degree is required.
3. All applicants must submit Graduate Record Examination (GRE) scores.
4. Three letters of recommendation.
5. Curriculum Vitae
6. An approved faculty member who agrees to be the student's Ph.D. advisor. The student must contact the faculty member with whom they want to work and obtain this approval before their application is considered for admission.
7. A statement of research interests and goals.
8. For admission and full funding consideration, please have your application completed by March 1st. Most decisions will be released by April 1st.
9. Current master's students in the WSU BME program must have:
 - a. At least 12 earned credits in the BME courses
 - b. A GPA of at least 3.3/4.0 in the BME courses
 - c. An approved faculty member who agrees to be the student's Ph.D. advisor

Overall Requirements

Code	Title	Credits
Completion of a minimum of ninety credits beyond the baccalaureate degree is required for the Ph.D. program.		
Minimum of 30 credits at the 7000-level or above (may include BME 7010, BME 7990, BME 8070 and BME 8080).		

Maximum 16 credits from BME 7990 and BME 8999 are applicable to the degree.

At least 30 credits of coursework, outside of dissertation direction, must be completed at Wayne State.

Credit Requirements

Code	Title	Credits
Core Courses (17-18 credits)		
BME 5010	Quantitative Physiology	4
BME 5020	Computer and Mathematical Applications in Biomedical Engineering	4
BIO 5040	Biometry	3-4
or FPH 7015	Biostatistics I	
or BIO 7045	Biometry	
BME 8070	Seminar in Biomedical Engineering	1
BME 8080	BME PhD Qualifying Exam	1
Elective Courses (42-43 credits)		
Minimum of 12 credits of lecture credits in the Biomedical Engineering program excluding the core courses, and the non-lecture courses (BME 7990 and BME 8999)		
BME 9990-Pre-Doctoral Candidacy Research credits do NOT count towards the degree		
Dissertation Courses (30 credits)		
Eligible to be taken after Ph.D candidacy status is approved		
BME 9991	Doctoral Candidate Status I: Dissertation Research and Direction	7.5
BME 9992	Doctoral Candidate Status II: Dissertation Research and Direction	7.5
BME 9993		7.5
BME 9994		7.5

General Requirements

An approved Plan of Work should be filed with the Office for Graduate Studies in the first year of the doctoral studies. The student must have filed the Plan of Work before being recommended for candidacy status. Courses to be applied to the degree requirements must be completed with a grade of B minus or higher.

Academic Scholarship: All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the College of Engineering (<http://bulletins.wayne.edu/graduate/college-engineering/academic-regulations/>).

Examinations: All Ph.D. students must pass the examinations outlined below. After successful completion of the written qualifying examination, a student may be admitted to the status of the doctoral candidate.

Written Qualifying Examination: All Ph.D. students are required to pass the written qualifying examination (Ph.D. Qualifying Exam (PQE)) before completion of forty-eight credits after their baccalaureate degree. Each student has two chances to pass the examination; if the exam is not passed by the second attempt, the student will be dismissed from the program (the option of obtaining a terminal master's degree will apply). The examination is offered once a year during the Winter semester (students must register for BME 8080 to write the PQE).

Dissertation Prospectus Defense (Oral Qualifying Examination): This examination shall be a presentation of the student's proposal for dissertation research, and will be administered by the student's Doctoral

Dissertation Committee. This Oral Examination MUST be satisfactorily completed AT LEAST twelve months prior to the Dissertation Defense.

Dissertation requirements are satisfied by the successful completion of thirty credits of dissertation research. The thirty-credit dissertation registration requirement is fulfilled by registering for the courses BME 9991, BME 9992, BME 9993, and BME 9994 (Doctoral Dissertation Research and Direction I, II, III, and IV, respectively), in consecutive academic year semesters. All Ph.D. students must pass the written qualifying examination and apply for doctoral candidacy before the election of dissertation credits. All Ph.D. students must register for dissertation credits or doctoral candidacy maintenance status (BME 9995) for any semester in which they utilize campus facilities or consult with faculty, even though they may not be enrolled in a formal lecture course.

The final dissertation must be submitted two weeks prior to the defense to the Dissertation Committee and Graduate Program Director. The advisor needs to submit the plagiarism check to the Graduate Program Director two weeks prior.

The dissertation defense will be publicized by public notice to the academic community one week prior. At this session, the candidate presents his/her doctoral research for final approval by the Doctoral Dissertation Committee.

A minimum of one first-author peer-reviewed journal publication is required before defending the Doctoral Dissertation.

For additional information, students should consult the Graduate School's regulations (<http://bulletins.wayne.edu/graduate/general-information/degree-certificate-requirements/#doctoraldegreesphdtext>) governing doctoral study.