Program Change Request

Date Submitted: 02/14/17 3:50 pm

Viewing: BMEGPH : Biomedical Engineering, Doctor of Philosophy

Last edit: 11/07/17 4:42 pm

Changes proposed by: kbalacha

Catalog Pages Using this Program

Biomedical Engineering (BMEG)

Submitter: kbalacha Phone: 5-3376

Program Status Active

Academic Level Graduate

Type of proposal Major/Field of Study

Select a reason for this modification

Making Minor Changes to an Existing Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding Focused Study)

Are you adding a concentration? No

Are you adding a track? No

Are you adding a focused study? No

Effective Catalog Year Fall 2018

College/School Code College of Engineering (ENGR)

Department Code Department of Biomedical Engineering (BMEG)

Program Code BMEGPH

Degree Doctor of Philosophy


Program Title Biomedical Engineering, Doctor of Philosophy

Program Delivery Method On Campus

Is this program interdisciplinary? Yes

College(s)/School(s)

College of Engineering (ENGR)

Does this proposal impact any courses from another College/School? No

What are the total hours needed to complete the program? 72

Program Requirements and Description

Requirements

Admission to Degree Program: Admission into the Ph.D. program with a concentration in Biomedical Engineering is a two-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School (see "The Graduate School:..."
Objectives, Regulations, Degrees" in this catalog or visit grad.uark.edu for details). Second, the student must be admitted to the Department of Biomedical Engineering on the basis of academic transcripts, standardized test scores, three letters of recommendation, and statement of purpose. All students in the Ph.D. program are offered either a research or teaching assistantship. A member of the faculty who is eligible (graduate faculty status of Group I), must agree to serve as the major adviser to the prospective student. Because of the multidisciplinary nature of Biomedical Engineering, students holding either Engineering or non-Engineering degrees are eligible to apply. Eligibility criteria are outlined below:

Engineering Academic Background: Students with a B.S. or M.S. degree in engineering or engineering equivalent are eligible to apply for the Ph.D. program.

Non-engineering Academic Background: Students with a non-engineering degree must fulfill the admission requirements for the Master of Science in Biomedical Engineering (M.S.B.M.E.) including the Minimum Admission Criteria Basic Engineering Education Requirements (see admission requirements for non-Engineering Majors (see admission requirements for the M.S.B.M.E.). Students with a non-engineering background may be admitted directly into the Ph.D. program; however, it is recommended that students first complete the M.S.B.M.E. degree before entering the Ph.D. program.

Complete details for admission may be obtained in the applicable section from the Biomedical Engineering website as well as in the BMEG graduate program handbook.

**Degree Requirements for the Doctor of Philosophy in Engineering with a concentration in Biomedical Engineering:** In addition to the requirements of the Graduate School and the College of Engineering, candidates must meet the following requirements:

- Develop a Plan of Study within the first year after matriculation.
- Complete an Annual Progress Report for each subsequent year of study.
- Complete at least 42 hours of course work beyond the B.S. degree in engineering or equivalent in the following four categories.

**Coursework Requirements:** Students are required to complete 42 credit hours of coursework beyond the B.S. degree in engineering or equivalent in the following four categories.

- **Submit and defend the final dissertation to the student's Dissertation Committee.**
- **Assist in departmental teaching for two semesters.**
- **Satisfactorily pass both a written and oral candidacy examination administered by the student's Program Advisory Committee.** Details of the candidacy exam are found in the BMEG graduate program handbook.
- **Complete 30 hours of dissertation.** Upon recommendation of the student's Program Advisory Committee, a student who has entered the Ph.D. program after a M.S. degree in engineering may receive credit for up to 24 hours of course work. See Coursework Requirements, below, for additional details.

For BS to PhD candidates a degree...
Biomedical Engineering Graduate Core (12 hours)

Biomedical Engineering Graduate Core (5 hours)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
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<tbody>
<tr>
<td>BMEG 5103</td>
<td>Design and Analysis of Experiments in Biomedical Research (Irregular)</td>
<td>12</td>
</tr>
<tr>
<td>BMEG 5203</td>
<td>Mathematical Modeling of Physiological Systems (Irregular)</td>
<td>5</td>
</tr>
<tr>
<td>BMEG 5504</td>
<td>Biomedical Microscopy (Irregular)</td>
<td></td>
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<tr>
<td>BMEG 5801</td>
<td>Graduate Seminar I (Fa)</td>
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<tr>
<td>BMEG 5811</td>
<td>Graduate Seminar II (Sp)</td>
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</table>

Life Science – minimum of six hours approved by the student’s Program Advisory Committee

Engineering Electives – minimum of nine hours approved by the student’s Program Advisory Committee

BMEG Electives – minimum of six hours of graduate-level classes in Biomedical Engineering approved by the student’s Program Advisory Committee

Detailed degree requirements may be obtained in the applicable program section from the Biomedical Engineering website as well as in the Biomedical Engineering graduate program handbook.

Students should also be aware of Graduate School requirements with regard to doctoral degrees.

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### Program Goals and Objectives

Program goals are broad general statements of what the program intends to accomplish and describes what a student will be able to do after completing the program. The program goals are linked to the mission of the university and the new strategic plan of the College of Engineering (COE).

Accordingly, the program goals of the MS and PhD programs in Biomedical Engineering at the University of Arkansas, Fayetteville are to produce graduates that are capable of:

1. Succeeding in practice at the interface between life science and engineering, or in other professional activities, or in post-master’s or Ph.D. studies.
2. Utilizing their advanced engineering education in creating new knowledge or enabling technologies for improvement of human health and healthcare.
3. Continuously upgrading their knowledge in their chosen specialty by initiating self-directed learning.

### Learning Outcomes

Student Learning Outcomes are defined in terms of the knowledge, skills, and abilities that students will know and be able to do as a result of completing a program. These student learning outcomes are directly linked to the accomplishment of the program goals.

The graduates of the MS and PhD programs in Biomedical Engineering will either be capable of the following or possess the following attributes:

1. Conceiving, designing, analyzing, and implementing systems, processes and experiments related to improving human health and healthcare.
2. Functioning in multidisciplinary teams to find effective solutions to complex technical problems and/or the design of new products and processes to improve human health and health care.
3. Using modern analytical, simulation, and diagnostic tools and techniques used in healthcare industry.
4. In-depth and up-to-date knowledge within a specialized field in Biomedical Engineering.
5. An understanding of ethical and professional responsibility
6. To effectively communicate their findings/ideas to a technical and non-technical audience

The prescribed outcomes of the MSBME are met through the curriculum followed by the students.

### Description and Justification of the Request

<table>
<thead>
<tr>
<th>Description of specific change</th>
<th>Justification for this change</th>
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<tbody>
<tr>
<td>1. Modifying admission requirements for students entering with a non-Engineering degree.</td>
<td>The requested changes are to streamline our program’s admission and degree requirements with those of comparable programs in the nation.</td>
</tr>
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<td>2. Modifying core course requirements for the program.</td>
<td>The requested changes are to streamline our program’s admission and degree requirements with those of comparable programs in the nation.</td>
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<td>3. Specifying the minimum number of 5000 level courses required in the program</td>
<td>The requested changes are to streamline our program’s admission and degree requirements with those of comparable programs in the nation.</td>
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Reviewer Comments

Patricia Koski (pkoski) (02/14/17 2:09 pm): Rollback: Please list the changes in the section on description of changes.

Norman Dennis (ndennis) (02/14/17 3:43 pm): Rollback: Please list the changes you are making in the Description and Justification for change section.

Norman Dennis (ndennis) (02/17/17 8:45 am): Added minimum credit hours for 5000 level courses.

Norman Dennis (ndennis) (02/24/17 12:49 pm): Modified the statement referring to 5000 level coursework to comply with ADHE requirements.

Alice Griffin (agriffin) (02/27/17 10:32 am): Updated program review date.

Lisa Kulczak (lkulcza) (03/08/17 11:59 am): Rollback: Are we in agreement that the effective date for these updates need to be Fall 2018?

Alice Griffin (agriffin) (03/10/17 3:12 pm): Due to approval timeline, changed effective date to fall 2018.

Manuel Rossetti (rossetti) (09/12/17 1:22 pm): Rollback: The EAPC suggests looking at the number of hours past the masters that would be in BMEG.

Manuel Rossetti (rossetti) (11/02/17 1:41 pm): Rollback: To make requested changes.

Norman Dennis (ndennis) (11/07/17 4:42 pm): added total hours required for the degree.