

Program Change Request

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

Viewing: **BMEGMS : Biomedical Engineering, Master of Science in Biomedical Engineering**

Last edit: 11/10/17 1:06 pm

Changes proposed by: kbalacha

In Workflow

1. ENGR Dean Initial
2. GRAD Dean Initial
3. Director of Program Assessment and Review
4. Registrar Initial
5. BMEG Chair
6. ENGR Curriculum Committee
7. ENGR Faculty
8. ENGR Dean
9. ENGR Dean
10. Global Campus
11. Provost Review
12. University Course and Program Committee
13. Graduate Committee
14. Faculty Senate
15. Provost Final
16. Provost's Office-- Notification of Approval
17. Registrar Final
18. Catalog Editor Final

Catalog Pages Using this Program Biomedical Engineering (BMEG)

Submitter: User ID: **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: BMEGMS

Degree: Master of Science in Biomedical Engineering

CIP Code: 14.0301 - Agricultural Engineering.

Program Title: Biomedical Engineering, Master of Science in Biomedical Engineering

Program Delivery Method: **On Campus**

Is this program interdisciplinary?
Yes

College(s)/School(s): College/School Name
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? **30**

Approval Path

1. 02/14/17 4:27 pm Norman Dennis (ndennis): Approved for ENGR Dean Initial
2. 02/14/17 5:05 pm Patricia Koski (pkoski): Approved for GRAD Dean Initial
3. 02/21/17 2:45 pm Alice Griffin (agriffin): Approved for Director of Program Assessment and Review
4. 04/10/17 3:09 pm Lisa Kulczak (lkulca): Approved for Registrar Initial
5. 04/11/17 11:09 am Raj Rao (rajrao): Approved for BMEG Chair
6. 09/12/17 1:21 pm Manuel Rossetti (rossetti): Rollback to BMEG Chair for

Program Requirements and Description

Requirements

Admission to Degree Program: Admission to the M.S.B.M.E. 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 a statement of purpose. Students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the **Minimum Admission Criteria for non-Engineering Majors basic Engineering Education Requirements** prior to being admitted. Complete details for admission may be obtained in the applicable program section from the [Biomedical Engineering website](#) as well as in the BMEG graduate program handbook. A general summary of admission requirements is given below:

A B.S. or M.S. degree in engineering or engineering equivalent or completion of the **minimum admission criteria for non-engineering majors Basic Engineering Education Requirements** (see below) with a GPA of at least 3.0.

A GPA of 3.0 or higher on the last 60 hours of the baccalaureate degree.

A GRE score of 302 or above (verbal and quantitative).

A TOEFL score of at least 213 (computer-based) or 80 (internet based). This requirement is waived for applicants whose native language is English or who earn a bachelor's or master's degree from a U.S. institution.

A member of the faculty who is eligible (graduate status of group III or higher) must agree to serve as the Major Adviser to the prospective student.

Minimum Admission Criteria for non-Engineering Majors: Basic Engineering Education Requirements: Prior to gaining admission into the M.S.B.M.E. program, students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the following coursework with a GPA of at least 3.0: **3 courses in Mathematics (selected from Calculus I, Calculus II, Calculus III, Linear Algebra, and/or Differential Equations), 2 courses 15 hours of Humanities/Social Sciences, 6 hours of English Composition, 16 hours of Mathematics (including Calculus I, Calculus II, Calculus III and Differential Equations), 8 hours of University-level Biology, 2 courses of 8 hours of University-level Chemistry, and 2 courses of Chemistry, 8 hours of University-level (calculus-based) Physics. In addition, students will be required to enroll and complete one of the following courses to provide adequate background in Physics, and 15 hours of Basic Engineering Design (BMEG2904 – Biomedical Instrumentation, BMEG3634 – Biomaterials, BMEG3124 – Biomedical Signals and Systems, or BMEG3824 – Biomolecular Engineering). Students should consult the Graduate Coordinator for a complete list of courses that satisfy the Minimum Admission Criteria. Topics (selected from courses such as Biomechanics, Thermodynamics, Bioinstrumentation, Fluid Mechanics, Transport Phenomena and others).**

~~Students should consult the Graduate Coordinator for a complete list of courses that satisfy the Basic Engineering Topics criterion.~~ Complete details for admission may be obtained in the applicable program section from the [Biomedical Engineering website](#) as well as in the BMEG graduate program handbook.

Requirements for M.S. Degree in Biomedical Engineering: Both thesis and non-thesis options are available for the M.S.B.M.E. degree. In general, students pursuing the thesis option are supported by research or teaching assistantships and conduct research under the guidance of a major adviser. Students pursuing the non-thesis options are typically not sponsored. For either option, all course work must be approved by the student's program advisory committee. The cumulative grade-point average on all graduate courses presented for the degree must be at least 3.0. A general summary of degree requirements is given below. More detailed information may be obtained from the [Biomedical Engineering website](#) as well as in the BMEG graduate program handbook.

Thesis Option: 24 hours of graduate-level course work, including ~~5~~ **12** hours of Biomedical Engineering Graduate Core as identified below, **at least 6 additional plus six** hours of **graduate-level classes in Biomedical Engineering, plus six hours of research resulting in a** written master's thesis. Candidates must pass a comprehensive final examination that will include an oral defense ~~of~~ **of** the master's thesis. The examination is prepared and administered by the student's master's thesis committee.

Non-thesis Option: 30 hours of graduate-level course work including **5 12** hours of Biomedical Engineering Graduate Core as identified **below, and at least 6 additional hours of graduate-level classes in Biomedical Engineering. below.**

Biomedical Engineering Graduate Core:

BMEG 5103	Design and Analysis of Experiments in Biomedical Research (Irregular)	3
BMEG 5203	Mathematical Modeling of Physiological Systems (Irregular)	3
BMEG 5504	Biomedical Microscopy (Irregular)	4
BMEG 5801	Graduate Seminar I (Fa)	1
BMEG 5811	Graduate Seminar II (Sp)	1

Students should also be aware of Graduate School requirements with regard to [master's degrees](#).

- ENGR Curriculum Committee
- 7. 09/14/17 12:08 pm
Raj Rao (rajrao):
Approved for BMEG Chair
- 8. 11/02/17 1:41 pm
Manuel Rossetti (rossetti): Rollback to BMEG Chair for ENGR Curriculum Committee
- 9. 11/03/17 1:30 pm
Raj Rao (rajrao):
Approved for BMEG Chair
- 10. 11/07/17 1:47 pm
Manuel Rossetti (rossetti): Approved for ENGR Curriculum Committee
- 11. 11/07/17 1:51 pm
Norman Dennis (ndennis): Approved for ENGR Faculty
- 12. 11/07/17 4:46 pm
Norman Dennis (ndennis): Approved for ENGR Dean
- 13. 11/07/17 4:50 pm
Norman Dennis (ndennis): Approved for ENGR Dean
- 14. 11/08/17 1:13 pm
Kiersten Bible (kbible): Approved for Global Campus
- 15. 11/10/17 10:35 am
Terry Martin (tmartin): Approved for Provost Review
- 16. 11/20/17 2:49 pm
Alice Griffin (agriffin): Approved for University Course and Program Committee
- 17. 12/20/17 9:02 am
Patricia Koski (pkoski): Approved for Graduate Committee

No

Are Similar Programs available in the area?

Estimated Student Demand for Program	50
Scheduled Program Review Date	2018-2019
Program Goals and Objectives	
Program Goals and Objectives	
<p>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).</p> <p>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:</p>	
<p>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.</p>	
<p>2. Utilizing their advanced engineering education in creating new knowledge or enabling technologies for improvement of human health and healthcare.</p>	
<p>3. Continuously upgrading their knowledge in their chosen specialty by initiating self-directed learning.</p>	
Learning Outcomes	
Learning Outcomes	
<p>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.</p> <p>The graduates of the MS and PhD programs in Biomedical Engineering will either be capable of the following or possess the following attributes:</p>	
<p>1. Conceiving, designing, analyzing, and implementing systems, processes and experiments related to improving human health and healthcare.</p>	
<p>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.</p>	
<p>3. Using modern analytical, simulation, and diagnostic tools and techniques used in healthcare industry.</p>	
<p>4. In-depth and up-to-date knowledge within a specialized field in Biomedical Engineering.</p>	
<p>5. An understanding of ethical and professional responsibility</p>	
<p>6. To effectively communicate their findings/ideas to a technical and non-technical audience</p>	
<p>The prescribed outcomes of the MSBME are met through the curriculum followed by the students.</p>	

Description and justification of the request

Description of specific change	Justification for this change
The requested changes are to streamline our program's admission and degree requirements with those of comparable programs in the nation via the following:	To align admission requirements with national norms for BMEG programs.
1. Modifying admission requirements for students entering with a non-Engineering degree. Establishing a set of foundational courses that the applicant must have to be accepted into the program.	To align admission requirements with national norms for BMEG programs.
2. Modifying core course requirements for the program.	To align admission requirements with national norms for BMEG programs.
3. Specifying the minimum number of BMEG Courses that must be taken for the MS degree.	To align admission requirements with national norms for BMEG programs.

Upload attachments

Reviewer Comments

Patricia Koski (pkoski) (02/14/17 2:10 pm): Rollback: Please list the changes in the section on description of the request.

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) (02/14/17 4:27 pm): Added language to clarify the math requirement and added items to the description of the change

Alice Griffin (agriffin) (02/21/17 2:45 pm): Due to the approval timeline to meet catalog copy, changed the effective date to fall 2018.

Manuel Rossetti (rossetti) (09/12/17 1:21 pm): Rollback: The EAPC suggests increasing the number of required BMEG hours for the students in the non-thesis option to ensure engineering design coverage.

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

Norman Dennis (ndennis) (11/07/17 4:45 pm): Modified Justification for changes.

Alice Griffin (agriffin) (11/10/17 10:47 am): Changed program review date from July 1, 2017 to 2018-2019 to match scheduled program review policy dates.

Alice Griffin (agriffin) (11/10/17 1:06 pm): Removed changes to the CIP Code so that minor changes could be approved. The department will need to submit an LON 1c in order to request a change to the CIP Code.

Key: 283