

Cover Sheet: Request 13533

Biomedical Engineering

Info

Process	Major Curriculum Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Kristin Theus undergrad@bme.ufl.edu
Created	1/22/2019 8:36:50 AM
Updated	2/15/2019 7:52:14 AM
Description of request	Request to reduce minimum critical tracking GPA from 3.0 to 2.8 for the Biomedical Engineering major. Students with a 2.8 critical tracking GPA can successfully complete the program without delays.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Biomedical Engineering 021934001	Daniel Ferris		1/22/2019
Biomedical Engineering Catalog Entry_update to CT GPA req.docx					1/22/2019
College	Recycled	ENG - College of Engineering	Heidi Dublin	Comments: Justification is flawed. Critical tracking GPA cannot be used to manage enrollment. It should be tied to success in the program. Students with a 2.8 CT GPA can successfully complete the program without delays.	1/31/2019
No document changes					
Department	Approved	ENG - Biomedical Engineering 021934001	Daniel Ferris		1/31/2019
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by HWCOE Curriculum Committee and at HWCOE Faculty Meeting	2/12/2019
No document changes					
Associate Provost for Undergraduate Affairs	Approved	PV - APUG Review	Casey Griffith		2/15/2019
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			2/15/2019
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					

Step	Status	Group	User	Comment	Updated
Academic Assessment Committee Notified					
No document changes					
College Notified					
No document changes					

Major|Modify_Curriculum for request 13533

Info

Request: Biomedical Engineering

Description of request: Request to reduce minimum critical tracking GPA from 3.0 to 2.8 for the Biomedical Engineering major. Students with a 2.8 critical tracking GPA can successfully complete the program without delays.

Submitter: Kristin Theus undergrad@bme.ufl.edu

Created: 3/7/2019 9:07:18 AM

Form version: 3

Responses

Major Name Biomedical Engineering

Major Code BME

Degree Program Name Bachelor of Science

Undergraduate Innovation Academy Program No

Effective Term Summer

Effective Year 2019

Current Curriculum for Major See document with track changes/

Proposed Curriculum Changes Change critical tracking minimum GPA from 3.0 to 2.8.

Pedagogical Rationale/Justification The BME Undergraduate Program Committee decided to reduce the minimum critical tracking GPA from 3.0 to 2.8. Students with a 2.8 critical tracking GPA can successfully complete the program within 4 year time to degree timeframe. A minimum 2.5 critical tracking GPA is required by all other engineering majors in the college. Reducing the critical tracking GPA for BME aligns more with other majors in the college.

Impact on Enrollment, Retention, Graduation Fewer students will be placed on probation and it may increase retention.

When using the minimum 3.0 CT GPA in fall 2017, we received 114 applications and admitted 104 sophomores, 8 of which were accepted to the major on academic probation for critical tracking GPAs within the range of 2.80-2.98. After fall 2017 grades were released, 5 additional students were placed on probation for critical tracking GPAs below the 3.0 minimum, for a total of 13 students on academic probation for the 2017 cohort. Of the 13 students on academic probation, 2 changed their major and the remainder have performed very well. Some of the students on probation reported feeling unsure about their ability to make progress in the major and overwhelmed at the pressure of earning higher than Cs in some critical tracking courses when their class schedules were challenging. However, they have continued to make adequate progress toward the major each term and are on track to graduate in Spring 2020, with the exception of 2 students who faced extenuating medical circumstances and are set to graduate in 2021. This shows us that students can still perform well in the BME major and graduate within a 4 year period.

We piloted the reduction of the minimum 2.8 CT GPA in fall 2018 for upper division applications received from sophomores. We decided to do not admit any students on academic probation for this cohort. We received 127 applications and admitted 116 students during this admission cycle. After fall 2018 grades were released, 2 students were placed on academic probation for critical tracking GPAs below 2.8. Neither of these students will face a delay in graduation pending successful completion of spring 2019 critical tracking courses.

Although we do not have hard data to show for this, we believe that we are losing applications from qualified sophomores who find the critical tracking minimum GPA of 3.0 daunting and do not feel prepared to enter the major. As a result, many of them change their major or pursue a major outside of engineering.

Assessment Data Review N/A

Academic Learning Compact and Academic Assessment Plan None

- [Save as PDF](#)

Biomedical Engineering

The biomedical engineering (BME) field has grown rapidly in the last 20 years. This growth was fueled by breakthroughs in molecular biology and many engineering technologies, symbolized by the Human Genome Project, arguably the greatest biomedical engineering accomplishment ever, and realized with creation of the National Institute of Biomedical Imaging and Bioengineering. BME now is clearly recognized as an integral part of the nation's and the world's efforts to deliver more effective and efficient medical care.

About this Major

- **College:** [Herbert Wertheim College of Engineering](#)
- **Degree:** Bachelor of Science in Biomedical Engineering
- **Credits for Degree:** 131
- [Academic Learning Compact](#)
- [Additional Information](#)

To graduate with this major, students must complete all university, college, and major requirements.

Critical TrackingModel Semester Plan

Overview

A biomedical engineer uses traditional engineering expertise to analyze and solve problems in biology and medicine, providing an overall enhancement of health care. Students choose biomedical engineering to serve people, to work with living systems and to apply advanced technology to the complex problems of medical care. The biomedical engineer is called upon to design instruments, devices and software, to bring together knowledge from many technical sources to develop new procedures and to conduct the research needed to solve clinical problems.

Bioengineering integrates sciences and engineering for the study of biology, medicine, behavior or health. It advances fundamental concepts, creates knowledge for the molecular to the organ systems levels, and develops innovative biologics, materials, processes, implants and devices.

Biomedical engineers create informatics approaches to prevent, diagnose and treat disease, applying systematic, quantitative and integrative thinking and solutions to problems important to biology, medical research and population studies.

BME typically is among the three most popular engineering majors and very often is the largest. The job market in biomedical engineering is the fastest growing of all engineering disciplines. It has become clear that the nation needs a variety of engineers with knowledge of biomedicine, including a cadre of exceptional people whose education thoroughly immerses them in engineering and biomedicine. The intellectual foundation of this limited-access undergraduate program is captured in this vision: Biomedicine comprises the science core while engineering provides the framework for inquiry. The curriculum incorporates exceptional rigor in both.

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Educational Objectives

The program educational objectives of the J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida are that:

1. Graduates will excel in top graduate programs of professional schools and will have successful careers in a multi-disciplinary, global industry.
2. Graduates will be active leaders in their profession, creating innovative, ethical and socially beneficial solutions to human health problems.

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Department Vision Statement

The faculty, students, and alumni of the J. Crayton Pruitt Family Department of Biomedical Engineering will lead in the discovery and development of innovative biomedical solutions to improve healthcare in the State of Florida and worldwide. To achieve this vision, the department will leverage the unique co-localization of talent and resources in engineering, biology, medicine, veterinary science, dentistry, and technology commercialization at the University of Florida, thereby maximizing opportunities for interdisciplinary student education and clinical translation of technologies to improve human health.

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Department Mission

The J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida is dedicated to developing innovative and clinically translatable biomedical technologies, educating future generations of biomedical engineers, and cultivating leaders, by nurturing the integration of engineering, science, and healthcare in a collaborative and dynamic educational and research environment.

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Admission Requirements

The biomedical engineering undergraduate major is a limited enrollment program. Students who enter the University of Florida as freshmen identify pre-BME as their major of choice and begin enrolling in the required critical tracking courses to prepare for upper division.

During the fall semester of sophomore year (semester 3), pre-BME majors apply for admission to the upper division major, which begins in the spring semester of sophomore year (semester 4).

Current UF students must meet the following minimum requirements to be considered for admission to the upper division program.

- Minimum 3.0 grade point average in critical tracking courses (best attempt)*
- No more than two attempts allowed for each critical tracking course (withdrawals included)
- Minimum grade of C in each critical tracking course
- Completion of the first three semesters of the Model Plan of Study by Fall semester of application
- BME Departmental online application

*Only the best attempt in each critical tracking course is considered for admission to the upper division program.

All application requirements and details are available on the [department website](#).

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Department Requirements

Minimum grades of C are required for BME3508, BME3053C, CHM3217, COP2271, COP2271L, EEL3003, and ENC3246. The minimum C grade is part of the prerequisite requirement for several

3000/4000-level BME courses. The prerequisite course and subsequent course cannot be taken in the same term, even if the prerequisite is being repeated.

All BME Electives must be selected from an approved list. Students may petition to take courses not included in the approved list toward this requirement. The BME Electives allow students to explore topic areas within their interests and are designed to build upon biomedical engineering foundation courses and laboratories.

A biomedical engineering student whose cumulative, upper-division or department grade point average falls below a 2.0 or whose critical tracking grades do not meet department requirements will be placed on academic probation and be required to complete a probation contract with a BME academic advisor. Students normally are allowed a maximum of two terms (consecutive or non-consecutive) on academic probation. Students who do not satisfy the conditions of the first term of probation may be dismissed from the department.

All graduating seniors must complete an exit interview with their advisor before graduating.

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Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida [Common Course Prerequisites](#) may be used for transfer students.

Semester 1

- Complete 3 of 11 critical-tracking courses with minimum grades of C within two attempts: BSC 2010; CHM 2045 or CHM 2095; CHM 2046 or CHM 2096; MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048; PHY 2049; BME 3060 and PCB 3717C
- ~~3.0~~2.8 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 3 additional critical-tracking courses with minimum grades of C within two attempts
- ~~3.0~~2.8 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- ~~3.0~~2.8 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete all critical-tracking courses with minimum grades of C within two attempts
- ~~3.0~~2.8 GPA required for all critical-tracking courses
- 2.0 UF GPA required

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Model Semester Plan

To remain on track, students must complete the appropriate critical tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Semester 1	Credits
BME 1008 Introduction to Biomedical Engineering	1
BSC 2010 Integrated Principles of Biology 1 <i>GE-B</i>	3
BSC 2010L Integrated Principles of Biology 1 Laboratory <i>GE-B</i>	1
CHM 2045 General Chemistry 1 (GE-P) or CHM 2095 Chemistry for Engineers 1	3

CHM 2045L General Chemistry 1 Laboratory <i>GE-P</i>	1
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IUF 1000 What is the Good Life <i>GE-H</i>	3
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MAC 2311 Analytic Geometry and Calculus 1 <i>GE-M</i>	4
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Total 16

Semester 2

Credits

CHM 2046 General Chemistry 2 (<i>GE-P</i>) or CHM 2096 Chemistry for Engineers 2	3
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CHM 2046L General Chemistry 2 Laboratory <i>GE-P</i>	1
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ENC 1101 Expository and Argumentative Writing <i>State Core GE-C; WR6</i>	3
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MAC 2312 Analytic Geometry and Calculus 2 <i>State Core GE-M</i>	4
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PHY 2048 Physics with Calculus 1 <i>State Core GE-P</i>	3
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PHY 2048L Laboratory for Physics with Calculus 1 <i>GE-P</i>	1
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Total 15

Semester 3	Credits
CHM 3217 Organic Chemistry/Biochemistry 1 <i>Can substitute CHM 2210 and CHM 2211</i>	4
COP 2271 Computer Programming for Engineers♦♦	2
COP 2271L Computer Programming for Engineers Laboratory♦♦	1
MAC 2313 Analytic Geometry and Calculus 3 <i>GE-M</i>	4
PHY 2049 Physics with Calculus 2 <i>GE-P</i>	3
PHY 2049L Laboratory for Physics with Calculus 2 <i>GE-P</i>	1

Total 15

Semester 4	Credits
	3
ENC 3246 Professional Communication for Engineers <i>GE-C; E6</i>	
BME 3060 Biomedical Fundamentals	3
	3
EEL 3003 Elements of Electrical Engineering	

MAP 2302 Elementary Differential Equations <i>GE-M</i>	3
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PCB 3713C Cellular and Systems Physiology	4
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BME 3053C Computer Applications for BME	2
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Total 18

This program is limited access and competitive. Students cannot register for courses in semesters 5-8 before they have been admitted to the biomedical engineering major.

[Application for admission](#) must be submitted by the deadline.

Semester 5	Credits
EGM 2511 Engineering Mechanics: Statics	3
BME 3101 Biomedical Materials	3
BME 4311 Molecular Biomedical Engineering	3
BME 3508 Biosignals and Systems	3
BME 4503 Biomedical Instrumentation	3
BME 4503L Biomedical Instrumentation Laboratory	1
	Total 16

Semester 6	Credits
BME 3323L Cellular Engineering Laboratory	3
BME 4632 Biomedical Transport Phenomena	3
	3
BME 3012 Clinically-Inspired Engineering Design	
Social and Behavioral Science ** <i>GE-S, N; E6</i>	3
STA 3032 Engineering Statistics	3
BME Elective	3
	Total 18

Semester 7	Credits
	3
Social and Behavioral Science ** <i>State Core GE-S</i>	
BME 4882 Senior Design, Professionalism and Ethics 1	3
BME 4409 Quantitative Physiology	3
BME 4621 Biomedical Thermodynamics and Kinetics	3

BME Elective ♦	6
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Total 18

Semester 8	Credits
BME 4883 Senior Design, Professionalism and Ethics 2	3
BME Elective ♦	6
	3
BME 4531 Medical Imaging	
Humanities ♦♦ <i>State Core GE-H; D</i>	3

Total 15

♦ BME Electives: A total of 15 credits of 3000/4000-level courses (9 credits of engineering electives and 6 credits technical electives, both of which must be selected from an approved list).

♦♦ These courses should cover 12,000 words.

♦♦♦ Course and corresponding laboratory to be completed in same language (Matlab or C++).

Students are also expected to complete the general education international (GE-N) and diversity (GE-D) requirements. This is often done concurrently with another general education requirement (typically, GE-C, H or S).

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