

# BME Ph.D. Program Curriculum

## Fall Year 1

16:125:xxx	BME Core Course (3cr) ( <i>Register for one, possibly two core courses</i> )
16:125:xxx	BME Core Course (3cr)
16:155:501	Mathematical Modeling for BME (3cr)
16:125:699	Non-Thesis Rotation (3cr)
16:125:601	Engineering Ethics/Seminar (1cr)
BME Seminars	(attendance required)

### Advisor Selection Forms (December through May)

## SPRING Year 1

16:125:xxx	BME Core Course (3cr) ( <i>Register for one or two core courses</i> )
16:125:xxx	Bioengineering Elective (3cr)
16:125:586	Structure and Dynamics in Adult and Stem Cell Biology (3cr)
16:125:602	Engineering Writing/Seminar (1cr)
16:125:702	Research (3+cr)
BME Seminars	(attendance required)

## SUMMER Year 1

**Research Based Qualifying Exam for Doctoral Studies tied in with “Engineering Writing 602” (May/June)**

## FALL Year 2

16:125:xxx	BME Core Course (3cr) ( <i>Register for one remaining core course, if any – see note*</i> )
16:125:xxx	Bioengineering Elective (3cr) ( <i>Register for one or two core courses</i> )
16:125:607	Preparing Future Faculty I (1cr)
16:125:701	Research (3+cr)
BME Seminars	(attendance required)

## SPRING Year 2

16:125:578	Interdisciplinary BioStatistics Research Training (3cr)
16:125:xxx	Bioengineering Elective (3cr)
16:125:xxx	Life/Medical Sciences Elective (3cr)
16:125:608	Preparing Future Faculty II (1cr)
16:125:628	Clinical Practicum (1cr)
16:125:702	Research (3+cr)
BME Seminars	(attendance required)

## SUMMER Year 2

**Annual Research Verification Meeting  
IDP Meeting  
Prepare Thesis/Dissertation Proposal**

## FALL Year 3

BME Seminars	(Attendance required)
16:125:701	Research (3+cr)
Electives	(As required)

### Deadline for Defense of Thesis/Dissertation Proposal

## SPRING Year 3

16:125:702	Research (3+cr)
Electives	(As required)

## Years 4-6

16:125:701/2	Research (3+cr)
BME Seminars	(Attendance required)
Electives	(Optional)

**Annual Research Verification Meetings (Summers of years 4-6)  
IDP Meetings (Summers of years 4-6)  
Final Thesis/Dissertation and Defense (Year 5 or 6)**

**\*Students are required to complete a total of 3 core BME courses, in addition to Math, Cell Biology and BioStatistics within the first four academic semesters.**

**BME Core Courses**                      **Must take 3 out of 5:**

- 1)        16:125:561                      BioImaging Methods (3cr)
- 2)        16:125:571                      Biosignal Processing and Biomedical Imaging (3cr)
- 3)        16:125:572                      Biocontrol, Modeling and Computation (3cr)
- 4)        16:125:573                      Kinetics, Thermodynamics and Transport in Biomedicine (3cr)
- 5)        16:125:574                      Biomechanics and Biomaterials (3cr)

**Physiology**

Students **must** have taken an UG level Physiology course previously or the following course must be taken.

- 1)        16:125:581                      Mammalian Physiology (online course-3cr)
- OR        Other Rutgers or RWJMS Physiology Courses – Contact the Graduate Program for information

**Advanced Engineering Mathematics<sup>^</sup>**

- 1)        16:125:501                      Mathematical Modeling for BME (3cr)

<sup>^</sup>Students may be asked to complete an alternate graduate-level math course based on need or availability. Students wishing to take an alternate math class should petition the graduate program director.

**Advanced Cell Biology**

- 1)        16:125:586                      Structure and Dynamics in Adult and Stem Cell Biology (3cr)

**Rigor and Reproducibility**

- 1)        16:125:578                      Interdisciplinary BioStatistics Research Training (3cr)

**Medical/Life Science Elective**

- 1)        Life Science elective from the list in the Graduate Handbook or recommendation from Program Director

**Developmental Courses**

- 1)        16:125:601                      Engineering Ethics (1cr) **(Required during 1<sup>st</sup> year)**
- 2)        16:125:602                      Engineering Writing (1cr) **(Required during 1<sup>st</sup> year)**
- 3)        16:125:607                      Preparing Future Faculty I (1cr) **(Required)**
- 4)        16:125:608                      Preparing Future Faculty II (1cr) **(Required)**
- 5)        16:125:628                      Clinical Practicum (1cr) **(Required)**

**Summary of Minimum Ph.D. Requirements**

<b>3 out of 5 BME Core Courses</b>	<b>9 credits</b>
<b>Advanced Engineering Math Course</b>	<b>3 credits</b>
<b>Advanced Cell Biology Course</b>	<b>3 credits</b>
<b>BioStatistics Course</b>	<b>3 credits</b>
<b>Life Science/Medical Elective</b>	<b>3 credits</b>
<b>3 Bioengineering Electives</b>	<b>9 credits</b>
<b>5 Developmental Courses</b>	<b>5 credits</b>
<b>Non-Thesis Study (1<sup>st</sup> year Rotation)</b>	<b>3 credits</b>
<b>Research (minimum)</b>	<b>34 credits</b>
<b>Total</b>	<b>72 credits (35 course credits)</b>

**Note:**

- Prerequisite work may not count as an elective. Please check with the program first.