BME Ph.D. Program Curriculum

Fall Year 1
16:125:xxx BME Core Course (3cr) (Register for one, possibly two core courses)
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)

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

SPRING Year 2
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 and Cell Biology within the first three 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**

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

^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)

**Medical/Life Science Elective**

1) Life Science elective from the list in the Graduate Handbook  or recommendation from Program Director
**Or** 16:148:514 Molecular Biology of Cells (3cr)
**Or** 16:115:511 Molecular Biology and Biochemistry (3cr)

**Developmental Courses**

1) 16:125:601 Engineering Ethics (1cr) (**Required during 1st year**)
2) 16:125:602 Engineering Writing (1cr) (**Required during 1st 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**)

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

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 out of 4 BME Core Courses</td>
<td>9 credits</td>
</tr>
<tr>
<td>Advanced Engineering Math Course</td>
<td>3 credits</td>
</tr>
<tr>
<td>Advanced Cell Biology Course</td>
<td>3 credits</td>
</tr>
<tr>
<td>Life Science/Medical Elective</td>
<td>3 credits</td>
</tr>
<tr>
<td>4 Bioengineering Electives</td>
<td>12 credits</td>
</tr>
<tr>
<td>5 Developmental Courses</td>
<td>5 credits</td>
</tr>
<tr>
<td>Non-Thesis Study (1st year Rotation)</td>
<td>3 credits</td>
</tr>
<tr>
<td>Research (minimum)</td>
<td>34 credits</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72 credits (35 course credits)</strong></td>
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</table>

**Note:**

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