Bachelor of Arts in Biology: Neurobiology

Overview of Course and Program Requirements

The Bachelor of Arts (BA) degree in Biology: Neurobiology is offered as a joint program between Rutgers University and the New Jersey Institute of Technology (NJIT) through the Federated Department of Biological Sciences. The BA major requires 38 credits of course work in biological sciences, plus cognate course credits in chemistry, physics, and mathematics. Courses are offered on the Rutgers and NJIT campuses.

✓ CORE COURSE REQUIREMENTS: All students are required to successfully complete the following courses with final grades of C or better: 120:200 Concepts in Biology (4 credits); 120:201 Foundations of Biology: Cell and Molecular Biology (3 credits) and 120:202 Foundations of Biology: Cell and Molecular Biology Lab (1 credit); 120:205 Foundations of Biology: Ecology and Evolution (3 credits), and 120:206 Foundations of Biology: Ecology and Evolution Lab (1 credit). These five courses (total of 12 credits) are the minimal prerequisites for all upper level courses in the program.

✓ CLUSTER AND LABORATORY REQUIREMENTS: Beyond the core courses, all students must successfully complete (grade of C or better) one course each from the Ecology and Evolutionary Framework Cluster, the Functional Organization Cluster, and the Molecular and Cellular Mechanism Cluster; and two courses from the Cellular and Systems Neuroscience Cluster (total of 16 Cluster Course Credits). Additionally, all students must successfully complete two courses designated as Laboratory Courses (8 credits). Courses taken in one category cannot be used to fulfill a requirement in another category; e.g., a laboratory course taken to fulfill the Functional Organization Cluster cannot simultaneously be used to fulfill the Laboratory requirement.

✓ ELECTIVES: Students complete their course of study by successfully completing, with grades of C or better, additional elective courses in biological sciences up to the minimally required 38 credits. It is imperative that students meet with their major advisor early and often in order to properly plan and manage their progress toward a BA degree in Biology: Neurobiology.

✓ WRITING REQUIREMENT (RU-Newark Matriculated Students): Among the courses successfully completed for the BA degree in Biology: Neurobiology, ONE of the courses must be designated as Writing Intensive (indicated as WI on the accompanying listing of courses). Scheduling and registration systems at Rutgers and NJIT designate these courses as Q and H, respectively. This course is included within the 38 degree-credits in Biology.

✓ COGNATE COURSE REQUIREMENTS: All cognate courses must be completed with grades of C or better. Cognate courses can be completed at either Rutgers or NJIT. Please note that in the case of sequential cognate courses (for example General Physics I and II and their labs) the entire sequence must be completed at one or the other campus—you cannot mix and match!

Declaration of Major

✓ RUTGERS MATRICULATED STUDENTS: Upon successful completion of one of the two Foundations course pairs (201/202 or 205/206), Rutgers students can officially declare their intention to pursue a course of study leading to a BA degree in Biology: Neurobiology.

✓ DECLARATION PROCESS: To declare their major, Rutgers students must visit the Biological Sciences Office in Boyden Hall 206 to submit an application for admission to the major. At this time the student’s record will be reviewed and, if accepted into the major, an academic major advisor will be assigned. Students should meet with their advisor on a regular basis, at least once a semester, to plan their course of study and eventually complete a graduation audit (see below).

✓ NJIT MATRICULATED STUDENTS: NJIT students may declare their major on entrance or within one year after first registration and to that effect they should visit NJIT’s Biological Sciences Office, which is located in Rm. 429, Colton-Annex on the NJIT campus.

Graduation Pre-certification

✓ Rutgers students preparing to graduate must do a graduation audit with their academic advisor, and complete the graduation pre-certification process. This should be done early in the semester before their last undergraduate semester of study. Specific deadlines are posted in the department office and the Dean of Students Affairs office. Students must officially file for graduation online: http://www.ncas.rutgers.edu/graduation.

✓ NJIT students preparing to graduate must complete an application for graduation (by October 15 for January graduation, and November 15 for May graduation). At this time the NJIT certification coordinator will sign the application and perform a graduation audit with the student. The application must be turned in to the registrar.

✓ Failure to complete the pre-certification process in the proper time window may jeopardize successful preparation for graduation.
### 1. CORE COURSES – 12 credits

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>21:120:200</td>
<td>Concepts in Biology</td>
<td>4 cr</td>
</tr>
<tr>
<td>21:120:201</td>
<td>Foundations: Cell &amp; Molecular Biology</td>
<td>3 cr</td>
</tr>
<tr>
<td>21:120:202</td>
<td>Foundations: Cell &amp; Molecular Biology Lab</td>
<td>1 cr</td>
</tr>
<tr>
<td>28:120:205</td>
<td>Foundations: Ecology and Evolution</td>
<td>3 cr</td>
</tr>
<tr>
<td>28:120:206</td>
<td>Foundations: Ecology and Evolution Lab</td>
<td>1 cr</td>
</tr>
<tr>
<td>28:120:447</td>
<td>Systems Neurobiology</td>
<td>3 cr</td>
</tr>
<tr>
<td>28:120:448</td>
<td>Neuropathophysiology (WI)</td>
<td>3 cr</td>
</tr>
</tbody>
</table>

### 2. BIOLOGICAL CONCEPTS CLUSTERS – 16 credits required

#### A) Ecological and Evolutionary Framework (1 course required)

- **28:120:222** Evolution FA, SP 4 cr

#### B) The Functional Organism (1 course required)

- **21:28:120:340** Mammalian Physiology FA, SP 4 cr

#### C) Molecular and Cellular Mechanisms (1 course required)

- **28:120:375** Principles of Neurobiology FA, SP 3 cr

#### D) Cellular and Systems Neuroscience (2 courses required)

- **28:120:341** Introduction to Neurophysiology FA 3 cr
- **21:120:444** Cellular Neurobiology (WI) SP 3 cr
- **28:120:447** Cellular & Systems Neurobiology SP 3 cr
- **21:750:203 or** General Physics I or II SP 4 cr
- **21:750:213** University Physics I SP 4 cr
- **21:750:204 or** General Physics II or II SP 4 cr
- **21:750:214** University Physics II SP 4 cr
- **21:750:205** Intro Physics Lab I FA 1 cr
- **21:750:206** Intro Physics Lab II SP 1 cr
- **21:640:135** Calculus I FA, SP 4 cr

### 3. LABORATORY EXPERIENCE – 2 courses required

- **21:120:285** Comparative Vertebrate Anatomy FA 4 cr
- **21:120:342 and** Developmental Biology and FA 4 cr
- **21:120:343** Developmental Biology Lab FA 4 cr
- **21:120:404** Intro to Neuroanatomy SP 4 cr
- **28:120:385** Evolution of Animal Behavior Lab (WI) FA 3 cr
- **28:120:451** Cell Physiology and Imaging (WI) VA 4 cr
- **21:120:452** Laboratory in Molecular Biotechniques (WI) FA, SP 4 cr

### 4. ADDITIONAL NEUROBIOLOGY COURSES

- **21:120:262** Animal Behavior SP 3 cr
- **28:120:337** Collective Intelligence in Biological Systems SP 3 cr

### 5. COGNATE COURSES

#### A) Rutgers Courses

- **21:160:115** General Chemistry FA, SP 4 cr
- **21:160:116** General Chemistry Lab FA, SP 1 cr
- **21:160:113** General Chemistry Lab FA, SP 1 cr
- **21:160:335** Organic Chemistry I FA 4 cr
- **21:160:333** Organic Chemistry II SP 4 cr
- **21:160:331** Organic Chemistry Lab FA 2 cr
- **21:750:203 or** General Physics I or II SP 4 cr
- **21:750:213** University Physics I SP 4 cr
- **21:750:204 or** General Physics II SP 4 cr
- **21:750:214** University Physics II SP 4 cr
- **21:750:205** Intro Physics Lab I FA 1 cr
- **21:750:206** Intro Physics Lab II SP 1 cr
- **21:640:135** Calculus I FA, SP 4 cr

#### B) NJIT Courses

- **CHEM 124** General Chemistry Lab FA, SP 1 cr
- **CHEM 125** General Chemistry I FA, SP 3 cr
- **CHEM 126** General Chemistry II FA, SP 3 cr
- **CHEM 243** Organic Chemistry I FA, SP 3 cr
- **CHEM 244** Organic Chemistry II FA, SP 3 cr
- **CHEM 244A** Organic Chemistry Lab FA, SP 2 cr
- **MATH 111** Calculus I FA, SP 4 cr
- **PHYS 111** Physics I FA, SP 3 cr
- **PHYS 121** Physics II FA, SP 3 cr
- **PHYS 111A** Physics Lab I FA, SP 1 cr
- **PHYS 121A** Physics Lab II FA, SP 1 cr

*Last Updated: August 7, 2016*