

# B.S. in Biology

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(128 credit minimum)

**First Year**

<b>1st Semester</b>		<b>Term Credits</b>
BIOL 200	Concepts in Biology	4
CHEM 121 or CHEM 125	Fundamentals of Chemical Principles I or General Chemistry I	3
MATH 111	Calculus I	4
HUM 101	English Composition: Writing, Speaking, Thinking I	3
BNFO 135	Programming for Bioinformatics	3
FRSH SEM	Freshman Seminar	0
<b>Term Credits</b>		<b>17</b>

**2nd Semester**

R120 201	Foundations Of Biology	3
R120 202	Foundations Of Biology Lab	1
CHEM 124	General Chemistry Laboratory	1
CHEM 122 or CHEM 126	Fundamentals of Chemical Principles II or General Chemistry II	3
MATH 112	Calculus II	4
HUM 102	English Composition: Writing, Speaking, Thinking II	3
Physical Education GUR Elective		1
<b>Term Credits</b>		<b>16</b>

**Second Year****1st Semester**

BIOL 205	Foundations of Biology: Ecology and Evolution Lecture	3
BIOL 206	Foundations of Biology: Ecology and Evolution Lab	1
CHEM 243	Organic Chemistry I	3
PHYS 111	Physics I	3
PHYS 111A	Physics I Laboratory	1
MATH 211	Calculus III A	3
BNFO 236	Programming For Bioinfo II	3
<b>Term Credits</b>		<b>17</b>

**2nd Semester**

CHEM 244	Organic Chemistry II	3
CHEM 244A	Organic Chemistry II Laboratory	2
PHYS 121	Physics II	3
PHYS 121A	Physics II Laboratory	1
Cognate (Math)		3-4
Social Sciences (lower level) GUR Elective		3
Physical Education GUR Elective		1
<b>Term Credits</b>		<b>16-17</b>

**Third Year****1st Semester**

Biology Functional Laboratory Elective <sup>1</sup>		3
Biology Cluster Elective		3
MATH 333	Probability and Statistics	3
English Composition and Cultural History (lower-level) GUR Elective		3
Social Science (lower-level) GUR Elective		3
<b>Term Credits</b>		<b>15</b>

**2nd Semester**

Biology Laboratory Elective <sup>1</sup>	3
Biology Cluster Elective	3
MGMT 390 Principles of Management	3
Humanities and Social Sciences (upper-level) GUR Elective	3
Technical Elective	3
<b>Term Credits</b>	<b>15</b>
<b>Fourth Year</b>	
<b>1st Semester</b>	
Biology Laboratory Elective	3
Biology Cluster Elective	3
Humanities and Social Sciences (upper-level) GUR Elective	3
Technical Elective	3
Free Elective	3
<b>Term Credits</b>	<b>15</b>
<b>2nd Semester</b>	
Biology Elective	3
Biology Elective	3
Humanities and Social Sciences (upper-level) Senior Seminar GUR Elective	3
Free Elective	3
Free Elective	3
<b>Term Credits</b>	<b>15</b>
<b>Total Credits</b>	<b>126-127</b>

<sup>1</sup> Technical Electives: Any course in Chemistry, Mathematics, or Environmental Science; Any course in Environmental Science, Computer Science or Engineering

Biology Credits: 35 (Including General Biology I, II, and Foundations of Biology)

## Biology Electives

One course must be taken from each cluster.

### Cluster A – Ecology and Evolution

BIOL 222	Evolution	3
R120 280	Ecology	3
R120 382	Animal Behavior	3
R120 370	Plant Ecology	3

### Cluster B – Functional Organism

R120 211	Plant Kingdom	4
R120 230	Biology Of Seed Plants	4
R120 330	Plant Physiology	4
R120 335	General Microbiology	4
R120 340 or BIOL 340	Mammalian Physiology	4
R120 342 & R120 343	Developmental Biology and Developmental Biology Lab	4

### Cluster C – Molecular and Cellular

R120 352	Genetics	3
R120 355	Cell Biology	3
R120 356	Molecular Biology	3
R120 360	Biochemistry	3

or CHEM 473

Biochemistry

**Laboratory Experience Courses**

R120 227	Biol Invertebrates	4
R120 285	Comparative Vertebrate Anatomy	4
R120 311	Flora of New Jersey	4
R120 313	Mycology	4
R120 325 & R120 326	Animal Parasites and Parasitology Lab	4
R120 358	Microanatomy Cells	4
R120 430	Plant Growth & Development	4
R120 481	Marine Biology	4
Any course from Functional Organism Cluster		4
R120 328	Ornithology	3
R120 371	Field Study Plant Ecology	3
R120 381	Ecological History of North Am	3
R120 380	Field Ecology	3
BIOL 475	Ecological Field Methods and Analysis	3
R120 486	Tropical Field Biology	2

**Biology Electives**

BIOL 225	Insects and Human Society	3
R120 346 or BIOL 346	Neurobiology	3
R120 350	Immunology	3
R120 365	Evolutions of Humans	3
BIOL 368	The Ecology and Evolution of Disease	3
MATH 371	Physiology and Medicine	3
MATH 372	Population Biology	3
MATH 373	Introduction to Mathematical Biology	3
BIOL 375	Conservation Biology	3
BIOL 383	Neural Basis of Behavior	3
R120 403	Biological Ultrastructure	3
R120 404	Intro to Neuroanatomy	4
R120 422	Biological Invasions	3
MATH 430	Analytical and Computational Neuroscience	3
BIOL 440	Cell Biology of Disease: Cells gone Bad!	3
R120 445	Endocrinology	3
BIOL 447	Systems Neurobiology	3
BIOL 448	Neuropathophysiology: Nervous System Gone Bad!	3
R120 451	Lab Cell Biophysics	4
R120 452	Molecular Biol Techniques	4
R120 455	Molec Cell Biology	3
R120 471	Ecological Physiology	3
R120 487	Systems Ecology: Ecosystems in the Landscape	3
BIOL 491 & BIOL 492	Research and Independent Study and Research and Independent Study	6

**General University Requirements and Electives****Computer Science**

BNFO 135	Programming for Bioinformatics	3
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**Management**

IE 492 or MGMT 390	Engineering Management Principles of Management	3
<b>Physical Education <sup>1</sup></b>		
PE 1XX	Physical Education course	1
Physical Education course		1
<b>Social Science (lower-level)</b>		
Select two of the following:		6
ECON 265	Microeconomics	
ECON 266	Macroeconomics	
EPS 202	Society, Technology, and the Environment	
STS 257	Technology, Society and Culture: An American View	
STS 258	Technology, Society and Culture: A Global View	
Approved introductory courses in basic social sciences at Rutgers-Newark		
<b>English Composition and Cultural History (lower-level)</b>		
HUM 101	English Composition: Writing, Speaking, Thinking I	3
HUM 102	English Composition: Writing, Speaking, Thinking II	3
Select one of the following:		3
HUM 211	The Pre-Modern World	
HUM 212	The Modern World	
HIST 213	The Twentieth-Century World	
HIST 2XX	History course at Rutgers-Newark	
<b>Humanities and Social Sciences (upper-level)</b>		
Select one of the following 300-level courses:		3
3XX	Literature course	
3XX	History course	
3XX	Philosophy course	
3XX	Science, Technology and Society course	
3XX	Approved 300-level course at Rutgers-Newark	
<b>Open Elective in Humanities and Social Sciences (upper-level)</b>		
Select one of the following 300-level courses:		3
3XX	English course	
3XX	History course	
3XX	Literature course	
3XX	Philosophy course	
3XX	Science, Technology and Society course	
3XX	Social Science course	
3XX	Theatre course	
ARCH 382		
3XX	Approved 300-level course at Rutgers-Newark	
<b>Senior Seminar in Humanities and Social Sciences (upper-level)</b>		
Select one of the following: <sup>2</sup>		3
HSS 403	Humanities Senior Seminar - Literature	
HSS 404	Humanities Senior Seminar - History	
HSS 405	Humanities Senior Seminar - Philosophy	
HSS 406	Humanities Senior Seminar - English	
HSS 407	Humanities Senior Seminar - Theater	
HSS 408	Humanities Senior Seminar - Science, Technology, and Society	
HSS 409	Humanities Senior Seminar - Social Science	
<b>Senior Seminar in Humanities and Social Sciences (upper-level) for Honors College Students</b>		
Select one of the following:		3
HSS 491H		

- 1 Students who register as full-time undergraduates for two or more consecutive semesters must take two PE courses. Students are urged to complete the requirement as soon as possible.
- 2 For students not enrolled in the Honors College.

*This curriculum represents the maximum number of credits per semester for which a student is advised to register. A full-time credit load is 12 credits. First-year students are placed in a curriculum that positions them for success which may result in additional time needed to complete curriculum requirements. Continuing students should consult with their academic advisor to determine the appropriate credit load.*