



BIOLOGY-MATHEMATICS DOUBLE MAJOR

Total Minimum Credits: 132

All biology, math, and cognate courses require grades of C or better.

YEAR 1

Fall Semester		Cr.	Spring Semester		Cr.
BIOL 200	Concepts in Biology	4	R120:201/202	Foundations of Cell/Molec	4
Chem 125	General Chemistry I	3	Chem 124	General Chem. Lab	1
Math 111	Calculus I	4	Chem 126	General Chemistry II	3
HUM 101	English I	3	Math 112	Calculus II	4
BNFO 135 ¹	Bioinformatics I	3	HUM 102	English II	3
Frsh Sem	Freshman Seminar	0	GUR Elective	Physical Education	1
		17			16

YEAR 2

Fall Semester		Cr.	Spring Semester		Cr.
BIOL 205/206	Foundation of Ecol/Evol	4	Chem 244/244A	Organic Chemistry II & Lab	5
Chem 243	Organic Chemistry I	3	Phys 121	Physics II	3
Phys 111	Physics I	3	Phys 121A	Physics II Lab	1
Phys 111A	Physics I Lab	1	Math 337	Linear Algebra	3
Math 211	Calculus IIIA	3	GUR Elective	Social Sciences ²	3
BNFO 136 ¹	Bioinformatics II	3	GUR Elective	Physical Education	1
		17			16

YEAR 3

Fall Semester		Cr.	Spring Semester		Cr.
Biology Elective	Cluster Elective - Functional Org	4	Math 373	Introduction to Math Bio	3
Biology Elective	Cluster Elective - Ecol/Evol	3	Biology Elective	Laboratory Elective ⁴	4
Math 222	Differential Equations	4	Math 331	Partial Differential Equations	3
Math 340	Numerical Methods	3	Math 332	Complex Variables	3
GUR Elective	English and Cultural History ³	3	GUR Elective	Social Sciences ²	3
		17			16

YEAR 4

Fall Semester		Cr.	Spring Semester		Cr.
Math 450	Capstone I	3	Math 451	Capstone II	3
Biology Elective	Cluster Elective - Molec/Cell	3	Biology Elective	Math Bio Elective	3
Biology Elective	Laboratory Elective ⁴	3	MGMT 390	Principles of Management	3
Math 333	Probability and Statistics	3	GUR Elective	HSS Upper Level ⁵	3
Math 480	Advanced Calculus	3	GUR Elective	HSS Senior Seminar	3
GUR Elective	HSS Upper Level ⁵	3			
		18			15

Total Credits: 132



Biology Credits: 35 ~ Math Credits: 39

¹ BioInformatics: CS 115 and CS 116 can be used to fulfill the sBNFO 135/136 requirements.

² Social Science Electives: *Two courses:* EPS 202, ECON 201, ECON 265, ECON 266, STS 257, STS 258; approved Rutgers courses.

³ English & Cultural History: Choice of HUM 211, HUM 212 or HIST 213; approved Rutgers course.

⁴ Laboratory Electives: *7 credits minimum:* Choice of *one* 4 credit laboratory *and one* 3 or 4 credit laboratory .

⁵ HSS Upper Level Electives: *Two courses:* 300-level courses in COM, ENG, HIST, LIT, PHIL, STS, THTR; approved Rutgers courses.



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REQUIRED CORE BIOLOGY COURSES ~ 15 Credits * REQUIRED CORE MATH COURSES ~ 39 Credits

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| <input type="checkbox"/> R120/BIOL 200 Concepts in Biology* (4cr) <i>*Effective from Fall 2011</i> | <input type="checkbox"/> Math 111, 112, 211: Calculus I, II, IIIA (11cr) |
| <input type="checkbox"/> R120:201 Foundations of Cell & Molecular Biology Lecture (3cr) | <input type="checkbox"/> Math 222 Differential Equations (4cr) |
| <input type="checkbox"/> R120:202 Foundations of Cell & Molecular Biology Lab (1cr) | <input type="checkbox"/> Math 331 Partial Differential Equations (3cr) |
| <input type="checkbox"/> BIOL 205 Foundations of Ecology & Evolution Lecture (3cr) | <input type="checkbox"/> Math 332 Complex Variables (3cr) |
| <input type="checkbox"/> BIOL 206 Foundations of Ecology & Evolution Lab (1cr) | <input type="checkbox"/> Math 333 Probability and Statistics (3cr) |
| <input type="checkbox"/> MATH 373 Introduction to Mathematical Biology (3cr) | <input type="checkbox"/> Math 337 Linear Algebra (3cr) |
| | <input type="checkbox"/> Math 340 Numerical Methods (3cr) |
| | <input type="checkbox"/> Math 450, 451 Capstone I & II (6cr) |
| | <input type="checkbox"/> Math 480 Advanced Calculus (3cr) |

CONCEPT CLUSTER COURSES ~ 10 Credits

Double Majors must complete one course from each of the following three concept cluster elective categories:

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|---|--|
| <input type="checkbox"/> Ecological and Evolutionary Framework (3cr)
Evolution (BIOL 222)
Ecology (R120:280)
Animal Behavior (R120:282)
Plant Ecology (R120:370) | <input type="checkbox"/> Molecular and Cellular Mechanisms (3cr)
Genetics (R120:352)
Cell Biology (R120:355)
Molecular Biology (R120:356)
Biochemistry (R120:360) |
| <input type="checkbox"/> The Functional Organism (4cr)
Plant Kingdom (R120:211)
Biology of Seed Plants (R120:230)
Plant Physiology (R120:330)
General Microbiology (R120:335)
Mammalian Physiology (R120:340)
Developmental Biology & Lab (R120:342/343) | |

LABORATORY/FIELD EXPERIENCE ~ 7 Credits

Majors must complete at least one 4-credit lab in this category:

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| <input type="checkbox"/> Four Credit Laboratories (4cr)
Plant Kingdom (R120:211)
Biology of Invertebrates (R120:227)
Biology of Seed Plants (R120:230)
Comparative Vertebrate Anatomy (R120:285)
Taxonomy of Vascular Plants (R120:311)
Mycology (R120:313)
Animal Parasites & Parasitology Lab (R120:325/326)
Plant Physiology (R120:330)
General Microbiology (R120:335)
Mammalian Physiology (R120:340)
Developmental Biology & Lab (R120:342/343)
Microanatomy of Tissues (R120:405)
Plant Growth and Development (R120:430)
Cell Physiology and Imaging (BIOL 451) | <input type="checkbox"/> Three Credit Laboratories (3cr)
Ecology of Birds (R120:328)
Field Plant Ecology (R120:371)
Field Ecology (R120:380)
Field Animal Ecology (R120:381)
Analytical Field Ecology (BIOL 475)

Tropical Field Ecology (R120:485) (2cr) |
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MATHEMATICAL BIOLOGY ELECTIVES ~ 3 Credits

Double Majors must complete one courses from the following list of (3-credit) Math Bio elective courses:

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- Math Bio Elective**
- (3cr)
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- Medicine and Physiology (Math 371)
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- Population Biology (Math 372)
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- Computational Neuroscience (Math 430)