Biology Major Checklist for the Specialization in Neuroscience

Name: _____ SB ID: _____ Today's Date: _____

Overall GPA: _____ Anticipated Graduation Date: _____ Future Plans: _____

Please refer to the Undergraduate Bulletin for the official policy, full course options, and requirements in detail.

Foundational Courses in Related Fields

At least one semester of the two-semester sequences of required courses in calculus, organic chemistry lecture, and physics lecture/ lab must be passed with a letter grade of C or higher. The organic chemistry lab must be passed with a C or higher.

General Chemistry

General Chemistry 1			Molecular Science 1	
General Chemistry 1 lab		*OR*	Molecular Science 1 lab	
General Chemistry 2				
General Chemistry 2 lab				

Organic Chemistry

Organic Chemistry 1			Molecular Science 2	
Organic Chemistry 2		*OR*	Molecular Science 3	
Organic Chemistry lab			Molecular Science 2 lab	

Calculus, Statistics, and Physics*

Calculus Semester 1		Physics Semester 1	
Calculus Semester 2		Physics Lab Semester 1	
		Physics Semester 2	
Statistics: BIO 211, AMS 110 *or* AMS 310		Physics Lab Semester 2	

* The Classical Physics A, B, C sequence requires 3 semesters of physics lecture.

Core Courses in Biology

Lecture Courses		Lab Courses	
BIO 201: Organisms to Ecosystems		BIO 204	
BIO 202: Molecular and Cellular Biology		BIO 205 *or* BIO 207	
BIO 203: Cellular and Organ Physiology			

Stony Brook Curriculum Courses

BIO 458: Speak Effectively Before an Audience (SPK)	
BIO 459: Write Effectively in Biology (WRTD)	

Advanced Course Requirements for the Specialization in Neuroscience

The list of Advanced BIO Courses and Accepted Electives for the Biology Major can be found on the back of this page. All courses must be passed with a letter grade of C or higher.
The Specialization in Neuroscience requires:

1. BIO 334 Principles of Neurobiology
2. BIO 335 Neurobiology Laboratory
3. Two of the following related lecture courses: BIO 317, BIO 328, BIO 337, BIO 338, BIO 339, BIO 347, BCP 401, EBH 316
4. Two additional advanced lecture courses with at least one from either Area I, Area III, or Area IV from the list of Advanced BIO Courses and Accepted Electives.
5. One additional advanced laboratory course from Area I, Area III, or Area IV. Note: the elective advanced laboratory course can be replaced by two semesters of independent research for a total of at least 4 credits in a BIO research course.
6. Additional advanced lecture, laboratory, reading, or independent research courses, as needed, for a minimum of 20 credits of advanced biology coursework.

Required Specialization Courses		Outside of Specialization Lecture Courses	
BIO 334			
BIO 335 (Lab)			
Related Lecture Course I		Outside of Specialization Lab Course	
Related Lecture Course II			

Advanced Course Credit Total (20 Credit Minimum)	

Upper-Division Writing Requirement

The advanced writing component of the major in Biology requires registration in the 0-credit BIO 459 and approval of either a term paper or a laboratory report written for an advanced course in the biological sciences at Stony Brook.

Upper–Division Writing Requirement	

Transfer students must take at least 15 credits of required core and advanced biology at Stony Brook in courses for majors at the 200 level or higher. Both of the two advanced laboratory experiences must be taken at Stony Brook.

Advanced BIO Courses and Accepted Electives for the Biology Major

The advanced BIO courses and Accepted Electives are listed below in groupings that correspond to four broad areas of biology. The advanced courses are listed below as: Course Indicator, Course Name, Course Type (lecture or lab), and semester usually offered. Please refer to the Undergraduate Bulletin for the most up-to date list including full course options, descriptions, policies, and pre-requisites in detail.

Area I: Biochemistry, Molecular and Cellular Biology

- BIO 310 Cell Biology (Lec) (SPRING)
- BIO 312 Bioinformatics and Computational Biology (Lec/Lab) (FALL) ♦
- BIO 314 Cancer Biology (Lec) (FALL)
- BIO 316 Molecular Immunology (Lec) (SUMMER)
- BIO 320 General Genetics (Lec) (SPRING) ♦
- BIO 361 Biochemistry I (Lec) (FALL/SPRING)
- BIO 362 Biochemistry II (Lec) (SPRING)
- BIO 364 Laboratory Techniques in Cancer Biology (Lab) (FALL) ♦
- BIO 365 Biochemistry Laboratory (Lab) (FALL/SPRING) ♦
- BIO 368 Food Microbiology (Lec)
- AMS 333 Mathematical Biology (Lec) (FALL)
- BME 304 Genetic Engineering (Lec) (SPRING)
- BME 404 Essentials of Tissue Engineering (Lec) (SPRING)
- CHE 346 Biomolecular Structure and Reactivity (Lec) (FALL)
- CSM 546 Topics Biotechnology (Lec/Lab) (SPRING)
- CSM 547 Topics in Genetics (Lec)
- EBH 302 Human Genetics (Lec) (FALL) ♦
- EBH 370 Advanced Human Genetics (Lec/Lab) (SPRING)

Area II: Neurobiology and Physiology

- BIO 317 Principles of Cellular Signaling (Lec) (FALL)
- BIO 328 Mammalian Physiology (Lec) (SPRING)
- BIO 332 Computational Modeling of Physiological Systems (Lec) (SPRING)
- BIO 334 Principles of Neurobiology (Lec) (SPRING)
- BIO 335 Neurobiology Laboratory (Lab) (FALL) ♦
- BIO 337 Neurotransmission and Neuromodulation: Implications for Brain Function (Lec) (SPRING)
- BIO 338 From synapse to circuit: Self-organization of the Brain (Lec) (FALL)
- BIO 339 Neurobiology of Disease (Lec) (FALL)
- BIO 347 Introduction to Neural Computation (Lec) (FALL)
- BIO 369 Animal Nutrition (Lec) (SPRING)
- BIO 547 Introduction to Neural Computation (Lec) (FALL)
- BCP 401 Principles of Pharmacology (Lec) (FALL)
- BME 301 Bioelectricity (Lec) (SPRING)
- BME 303 Biomechanics (Lec) (FALL)
- EBH 316 The Evolution of the Human Brain (Lec) (FALL)
- EBH 331 Hormones and Behavior (Lec)
- NEU 517 Principles of Cell Signaling (Lec) (FALL)
- NEU 547 Introduction to Cell Signaling (Lec)

Area III: Organisms

- BIO 315 Microbiology (Lec) (SPRING)
- BIO 325 Animal Development (Lec) (FALL)
- BIO 327 Developmental Genetics Laboratory (Lab) (SPRING) ♦
- BIO 341 Plant Diversity (Lec/Lab) (SPRING)
- BIO 342 Invertebrate Zoology (Lec) (FALL)
- BIO 343 Invertebrate Zoology Laboratory (Lab) (FALL)
- BIO 344 Chordate Zoology (Lec/Lab) (SPRING) ♦
- BIO 348 Diversity and Evolution of Reptiles and Amphibians (Lec)
- BIO 366 Molecular Microbiology Laboratory (Lec/Lab) (FALL) ♦
- CSM 548 Current Topics in Microbiology (Lab) (FALL)
- MAR 370 Marine Mammals (Lec) (FALL)
- MAR 375 Marine Mammal and Sea Turtle Rehab. (Lec) (SPRING)
- MAR 376 Biology and Conservation of Sea Turtles (Lec) (FALL)
- MAR 377 Biology and Conservation of Seabirds (Lec) (SPRING)
- MAR 380 Ichthyology (Lec/Lab) (FALL)

♦ Indicates that the upper division writing requirement can be completed in the course

Area IV: Ecology and Evolution

- BIO 319 Landscape Ecology Laboratory (Lab) (FALL)
- BIO 321 Ecological Genetics (Lec) (SPRING) ♦
- BIO 336 Conservation Biology (Lec) (FALL) ♦
- BIO 351 Ecology (Lec) (FALL)
- BIO 352 Ecology Laboratory (Lab) (FALL) ♦
- BIO 353 Marine Ecology (Lec) (SPRING) ♦
- BIO 354 Evolution (Lec) (FALL) ♦
- BIO 356 Population and Community Ecology Computer Laboratory (Lab) (SPRING) ♦
- BIO 358 Biology and Human Social and Sexual Behavior (Lec) (SPRING)
- BIO 367 Molecular Diversity Laboratory (Lab) (SPRING) ♦
- BIO 383 Paleobiology (Lec/Lab) (SPRING)
- BIO 384 Intermediate Statistics (Lec) (FALL)
- BIO 385 Plant Ecology (Lec) (SPRING) ♦
- BIO 386 Ecosystem Ecology & the Global Environment (Lec) (SPRING) ♦
- BIO 558 Biology and Human Social and Sexual Behavior (Lec) (SPRING)
- ANP 360 Primate Conservation (Lec)
- CEB 556 Ecology (Lec)
- EBH 359 Behavioral Ecology (Lec) (FALL)
- EBH 380 Genomics (Lec) (FALL) ♦
- EBH 381 Genomics Laboratory (Lec/Lab) (SPRING)
- ENS 311 Ecosystem Ecology and the Global Environment (Lec, not for credit in addition to BIO 386) (SPRING)
- ENV 301 Sustainability of the Long Island Pine Barrens (Lec)
- MAR 301 Environmental Microbiology (Lec/Lab) (FALL)
- MAR 302 Marine Microbiology and Microbial Ecology (Lec, not for credit in addition to MAR 301) (SPRING)
- MAR 303 Long Island Marine Habitats (Lec/Lab) (FALL)
- MAR 305 Experimental Marine Biology (Lab) (FALL)
- MAR 315 Marine Conservation (Lec) (SPRING)
- MAR 320 Limnology (Lec/Lab) (SPRING)
- MAR 373 Marine Apex Predators: Ecology and Conservation (Lec) (FALL)
- MAR 384 Diseases of Aquatic Organisms (Lec) (SPRING)
- MAR 386 Ecosystem Science for Fisheries Management (Lec)

Study Abroad Course Options in Area IV

Jamaica:

- MAR 388 Tropical Marine Ecology (Lec/Lab) (WINTER)

Turkana Basin:

- ANP 304 Ecology: Linking People and Nature (Lec)
- ANP 305 Earth & Life Through Time: Vertebrate Paleontology & Paleoecology (Lec)
- ANP 306 Human Evolution (and evidence from the Turkana Basin) (Lec)

Madagascar:

- ANP 307 Comparing Ecosystems in Madagascar (Lec)
- ANP 326 Lemurs of Madagascar (Lec)
- ANP 350 Methods in Studying Primates (Lec)
- ANP 351 Biodiversity Assessment Methods for Tropical Field Research (Lec)
- ANP 391 Topics in Biological Anthropology (Lec)