



**CAS, Biology**

**Annual Academic Planning Self-Study Update 2012:**

Matching the Class Schedule and Faculty Assignments to the Educational Mission

**STEP I. THE CURRICULAR CONTEXT**

Throughout this self-study, please add any explanatory notes you believe will help us understand the situation.

**A. Degrees, Minors, and Certificates offered by your program, individually or jointly**

1. List all *undergraduate and graduate degrees offered by your program* (i.e. BA majors, Master's degrees, doctoral degrees) and all joint degrees for which your program is responsible.

Bachelor of Arts in...

1. Biology
2. Biology with Specialization in Ecology and Conservation Biology
3. Biology with Specialization in Neurobiology
4. Biology with Specialization in Quantitative Biology
5. Biology with Specialization in Cell Biology, Molecular Biology and Genetics
6. Biology with Specialization in Behavioral Biology

Master of Arts in Biology

Doctor of Philosophy in Biology

2. List all *undergraduate minors* offered by your program.

Minor in Biology

3. List all *certificate programs* for which your program is responsible or shares responsibility.

Certificate in Terrestrial Biogeosciences (PhD)

**B. Undergraduate majors offered by other departments and programs that depend on coursework in your program**

1. Undergraduate Majors in CAS: Using the listing of BA programs at <http://www.bu.edu/academics/cas/programs/> to ensure completeness, list all CAS majors other than those administered individually or jointly in your department whose requirements (as spelled out in departmental sections of the bulletin) include coursework in your department.

Anthropology (Biological Anthropology)

Biochemistry and Molecular Biology (BMB)

Chemistry: Biochemistry

Earth & Environment: Environmental Analysis and Policy

Earth & Environment: Environmental Science

Earth & Environment: Physical Geography

Marine Science

Neuroscience

Seven Year Liberal Arts / Medical Education Program  
Seven Year Liberal Arts / Dental Education Program  
Women's, Gender & Sexuality Studies

2. Undergraduate majors and degrees outside CAS: Using the list of BU Schools and Colleges at <http://www.bu.edu/academics/> to ensure completeness, list all non-CAS undergraduate degree programs whose requirements include coursework in your department.

College of Engineering: Biomedical Engineering  
Sargent College  
Athletic Training  
Athletic Training/Physical Therapy  
Speech, Language and Hearing Sciences  
Exercise Science  
Health Science  
Human Physiology  
Nutritional Science  
Occupational Therapy  
Physical Therapy  
Rehabilitation and Human Services

3. Undergraduate minors: Using the listing of minors at <http://www.bu.edu/academics/cas/programs/>, list all (CAS and other) minors whose requirements can be fulfilled by required or elective coursework in your department.

Earth & Environment: Environmental Science  
Marine Science

**C. Graduate programs offered by other departments and schools that depend on coursework in your program**

1. GRS Master's Programs outside your department. Using the list at <http://www.bu.edu/academics/grs/programs/>, list all Master's degree programs whose requirements (as spelled out in departmental sections of the bulletin) include coursework in your department.

Program in Bioinformatics  
Molecular Biology, Cell Biology and Biochemistry (MCBB)  
Graduate Program in Neuroscience  
Earth & Environment  
Earth & Environment/CEES: Energy & Environmental Analysis  
Earth & Environment/CEES: Environmental Remote Sensing & GIS

2. GRS Doctoral Programs. Using the list at <http://www.bu.edu/academics/grs/programs/>, list all doctoral programs whose requirements (as spelled out in departmental sections of the bulletin) include coursework in your department.

Program in Bioinformatics  
Molecular Biology, Cell Biology and Biochemistry (MCBB)  
Graduate Program in Neuroscience  
Certificate in Terrestrial Biogeosciences  
Earth & Environment

3. Non-GRS Graduate Degrees. Using the list of Schools and Colleges at <http://www.bu.edu/academics/>, list any non-GRS graduate programs whose requirements include coursework in your department.

College of Engineering: Biomedical Engineering  
School of Medicine: Anatomy and Neurobiology  
School of Education: Certificate in Global Ecology Education

**D. College Requirements and Programs: Writing, Foreign Language, Math, Core Curriculum, Divisional Studies**

In general, all departments and programs have responsibilities for selected aspects of the CAS curriculum that go beyond the major. *Describe* your department's typical role in any of the following in which it has participated. (In what ways has your department contributed? To what extent?) For any aspect in which your department (including through individual faculty) has not played a recent role, enter "None."

1. Core Curriculum

Two Biology faculty members have for many years participated in teaching in CC 106 during spring semester; current and recent participants include Profs. Atema, Finnerty, Mullen Schneider and Warkentin.

2. Kilachand Honors College

Profs. Primack and Kaufman have offered and/or participated in courses for KHC, including KHC BI 101, KHC BI 102, and KHC HC 301.

3. Teaching seminars toward fulfillment of the College Writing requirement

4. Implementation of the foreign language requirement

5. Offering Divisional Studies courses that also serve as gateways to your major(s)

BI 107 Biology I  
BI 108 Biology II  
BI 118 Biology II (Honors)

6. Offering Divisional Studies courses that *do not* also count toward majors in your department or division

BI 111 Brain, Hormones & Behavior  
BI 114 Human Infectious Diseases: Aids to TB  
BI 117 Intro Global Ecology (not currently offered)  
BI 119 Sociobiology

7. Offering selected courses that are not important for fulfilling requirements for your major(s) or minor(s), but are in very high demand by students because of their interests

BI 105 Introductory Biology for Health Sciences  
BI 106 Human Anatomy  
BI 114 Human Infectious Diseases: Aids to TB  
BI 117 Intro Global Ecology (not currently offered)  
BI 119 Sociobiology  
BI 211 Human Physiology  
BI 281 Fundamentals of Biology I (7-Year Med)  
BI 282 Fundamentals of Biology II (7-Year Med)

8. Any other aspects of the CAS curriculum you want to mention

- Prof. Warkentin is a member of the team teaching WS 101 in Women's, Gender & Sexuality Studies
- We provide the lecture portion of NE 203 Principles of Neuroscience for the Undergraduate Neuroscience Program

BME, MET, BU Academy

- We provide BI 105AC and BI 107AC for the BU Academy
- BE 209 is a required BME course, with the laboratory portion coordinated by Biology and staffed by Biology graduate teaching fellows
- We also offer courses at Metropolitan College

Additional Comments:

## STEP II. ASSESSMENT OF CURRICULAR OBLIGATIONS AND NEEDS

### A. OBLIGATIONS TOWARD UNDERGRADUATE EDUCATION.

1. Which courses and course types should be offered *every semester*?

All Biology students are required to take one course in each of three major areas to satisfy a **distributional requirement for the major**: this includes BI 203 (213) or 206 (216) for the CM requirement; BI 260, 303, 306, 309, or 407 for the EBE requirement; and BI 315 or 325 for the physiology/neurobiology requirement. Many students take 203/206 (both discussion courses) in a two-course sequence during sophomore year. Of the EBE courses, BI 303 is the default option for most students and it is a prerequisite for a number of advanced electives, including the Tropical Ecology Program. Student demand is consistently high for BI 315, another laboratory course that also serves SAR and BME students, and demand has steadily increased for BI 325, which during Fall semester shares a single lecture section with NE 203. To provide flexibility for students and, in part to facilitate the scheduling of laboratory sections for BI 303 and BI 315, it is important that the following courses are offered every semester.

	<u>Enrollments (2006-present)</u>
BI 303 Ecology	35-85 (115-134 annually)
BI 315 Systems Physiology	180-293 (372-507 annually)
BI 325 Principles of Neuroscience (since 2011, shares lecture session with NE 203 in Fall)	41-75 (103-138 annually)

This set of four courses, comprising the **Tropical Ecology Program** in Ecuador, are also offered every semester. While enrollments are small, this unique, international program provides a high quality field-based learning experience for our undergraduates and is the highpoint of the Biology experience for many of our students.

	<u>Enrollments (2006-present)</u>
BI 438 Tropical Montane Ecology	6-20 (15 – 30 annually)
BI 439 Tropical Rain Forest Ecology	6-20 (15 – 30 annually)
BI 440 Tropical Coastal Ecology	6-20 (15 – 30 annually)
BI 441 Studies in Tropical Ecology	6-20 (15 – 30 annually)

2. Which courses and course types should be offered *annually*?
3. Which courses and course types should be offered *every other academic year or every third year*?

Based on the above list of courses that satisfy the **distributional requirement** within the Biology major and adding in our **introductory courses**, the following courses must be offered **annually**. BI 107 and 108/118 also satisfy CAS divisional requirements and many of these courses contribute to curricula for BMB, Neuroscience, or Earth & Environment. These courses have consistently strong enrollments:

	<u>Enrollments (2006-present)</u>
BI 107 Biology I	473-530
BI 108 Biology II	569-712
BI 118 Biology II (Honors)	31-52
BI 203 Cell Biology	189-326
BI 213 Intensive Cell Biology	22-106
BI 206 Genetics	127-230
BI 216 Intensive Genetics	73-102
BI 260 Marine Biology	88-144
BI 306 Biology of Global Change	40-50
BI 309 Evolution	39-78
BI 407 Animal Behavior	28-74

### **Biology Electives**

Undergraduate majors in Biology take at least 7 courses after BI 107/108 and many students take up to 10 courses to complete a major in Biology with specialization. Thus, we need to offer a range of electives every semester in each of three major subject areas (see below). Many of these courses are offered annually, others in alternate years, with the precise mix of advanced electives varying particularly in EBE (see below for more information). Students are also required to complete 3 laboratory courses after BI 107/108, two of which are often BI 303 and BI 315 (listed above). Thus, students need at least 1 and as many as 3 lab courses among their advanced electives; given relatively few lab courses among our advanced electives, it is important that these courses are offered annually. Lab courses are marked by an asterisk below.

### **Neurobiology**

In addition to BI 325 (listed above), we offer the following Neurobiology courses. Median, aggregate enrollment in these courses since 2006 has been about 70 students per semester, but this increased to 122 in Fall 2012 when most of these Biology courses were cross-listed as Neuroscience electives. Given the aggregate, per semester enrollment of 70, we should offer at least 4 neurobiology electives per semester and 8 per year. If enrollments continue at the higher level of ~120, this should increase to 5 courses per semester and 10 per year. Thus, most or all of these courses should be offered **annually**.

- BI 230 Behavioral Endocrinology
- \*BI/NE 444 Neuroethology (reactivated for Spring 2013 w/ added lab)
- \*BI/NE 445 Cellular and Molecular Neurophysiology (now w/ lab)
- BI/NE 455 Developmental Neurobiology
- BI/NE 481 Molecular Biology of the Neuron
- BI 502 Theory of Biological Networks

BI/NE 520 Sensory Neurobiology  
 BI/NE 545 Neurobiology of Motivated Behavior  
 BI/NE 554 Neuroendocrinology  
 \*BI 575 Tech Cell Molec Neurobiol (currently inactive)  
 BI 594 Topics in Neurobiology: Channelopathies (new in 2012)  
 BI 599 Neurobiology of Synapses

**Cell and Molecular Biology (including courses in physiology, endocrinology & development)**

Following Cell Biology (BI 203/216) and Genetics (BI 206/216), we offer the following CM electives, many of which also support the undergraduate BMB major. Of these, four courses have large enrollments and must be offered **annually**. Two sections of BI/CH 421 each fall are generally staffed by one Biology faculty member and one Chemistry faculty member.

	<u>Enrollments (2006-present)</u>
*BI 311 Microbiology	71-85
*BI/CH 421 Biochemistry I	148-183 (total for 2 sections)
*BI/CH 422 Biochemistry II	72-103
BI 552 Molecular Biology I	92-135

Since 2006, the remaining CM electives (listed below) have had median aggregate enrollments of 84 in Fall (increasing to 110 in 2011 and 123 in 2012), and 164 in Spring. The greater demand in Spring is a function of the much larger number of students taking the “core” courses listed above in the Fall (BI 203/213/281, 421, and 552) than in the Spring (BI 206/216/282, 311, and 422). Thus, we should ideally offer at least 4 of the following electives in Fall and 6-8 of these courses in Spring. Thus, almost all of these courses should be offered **annually**. The retirements of Prof. Patt (BI 304), Godrick (BI 385) and IP Callard (BI 425, 442) will in the short term have a negative impact on the range of choices for undergraduates. One new course starting in Spring 2013 (BI 560) will help offset these losses.

BI 304 Morphogenesis (currently inactive)  
 BI 385 Immunology (uncertain plan for staffing after Fall 2012)  
 BI 403 Cell Physiology and Structure (new for 2013)  
 BI 410 Cellular Aspects of Develop. & Differentiation  
 BI 425 General Endocrinology (currently inactive)  
 BI 442 Physiology & Biochemistry of Reprod. (inactive)  
 BI 446 Biology of the Cell Cycle  
 \*BI 513 Genetics Laboratory  
 BI 551 Stem Cells  
 \*BB 522 Molecular Biology Lab  
 BI 553 Molecular Biology II  
 BI 556 Membrane Biochem & Cell Signaling (alt years)  
 BI 560 Systems Biology (new in Spring 2013)  
 BI 572 Advanced Genetics (alt years)  
 BI 576 Carcinogenesis

**Ecology, Behavior & Evolution**

In addition to BI 260, 303, 306, 309 and 407 (listed above), we offer the following EBE electives. Median, aggregate enrollment in these courses since 2006 has been about 101 students per semester, but recently has been as high as 168 students (Spring 2012). Given these aggregate, per semester enrollments, we should offer at least 5 additional EBE electives per semester and 10 per

year. Given the range of electives listed below, a few of these courses can be offered in alternate years, but most should be offered **annually**. BI 302 (a lab course) and BI 448 (required for the Ecology and Conservation Biology specialization) should be offered **annually**. Many of these courses are also available as electives for majors in Earth & Environment.

\*\*In AY13/14, due to the combination of other commitments involving EBE faculty (Marine Semester, Core Curriculum, Women's Studies), the absence of Tom Kunz, and planned sabbaticals, we currently have plans in place for only 2 of these courses in Fall 2013 (BI 443, 519) and 4 of these courses in Spring 2014 (BI 302, 416, 448, 515).

BI 224 Seminar in Behavioral Biol

\*BI 302 Vertebrate Zoology (lab)

BI 305 Plant Biology (currently inactive)

\*BI 310 Comparative Vertebrate Anatomy

BI 448 Conservation Biology

BI 414 Ornithology

\*BI 415 Biology of Mammals (currently inactive)

BI 416 Herpetology (planned for Spring 2014)

BI/ES 443 Terrestrial Biogeochemistry

BI 486 Sustainability (currently inactive)

BI 503 Symbiosis

BI 504 Advanced Evolution

BI 505 Evolution & Development (currently inactive)

BI 506 Phenotypic Plasticity

BI 508 Behavioral Ecology

BI 515 Population Genetics

BI 519 Theoretical Evolutionary Ecology

BI/GE 530 Forest Ecology

BI 543 Global Ecology (new in Fall 2012)

BI 549 Molecular Phylogenetics & Evolution (inactive)

### Marine Semester

These **annual** courses are offered each Fall as part of the **Marine Semester**, which seeks to offer a total of 12 courses (3 course in each of 4 blocks) in Biology, Geography and Earth Sciences. Enrollments in these intensive block-format courses typically range from 10 to 20 students.

BI 531 Ichthyology I

BI 532 Ichthyology II (no longer offered as of 2012)

BI/ES 539 Coral Reefs

BI 546 Ocean Megafauna

BI 547 Marine Invertebrates (currently replaced by BI 569)

BI 550 Marine Genomics

BI 563 Chemosensory Biology

BI 569 Tropical Invertebrates: Nat'l Hist. & Molec. Phyl.

### Service Courses

These **annual** courses are provided as a **service** to Sargent College, the Core Curriculum, the Neuroscience program, BME, and the Seven-Year Liberal Arts/Medical Education Program

	<u>Enrollments (2006-present)</u>
BI 105 Introductory Biology for Health Sciences	95-179

BI 106 Human Anatomy	136-234
BI 114 Human Infectious Diseases: Aids to TB	87-135
BI 211 Human Physiology	123-195
NE 203 Principles of Neuroscience	71, 85 (2011, 2012)
(shares lecture with BI 325, separate lab sections run by Neuro)	
BE 209 Principles of Biology	77-107
(lab sections only handled by Biology)	
BI 281 Fundamentals of Biology I (meets w/ BI 203)	18-30
BI 282 Fundamentals of Biology II (meets w/ BI 206)	21-30
CC 106 Natural Sciences II	91-282

Note: CC 106 enrollments have declined each year from 2006 to 2012

### Non-majors Courses for Divisional Credit

These courses are offered to **non-majors for divisional credit** (Note that BI 105, 106, and 114 are listed above and serve a dual purpose). While the specific courses can change, we should ideally have at least one non-majors course per semester (in addition to BI 105/106) and ideally two to provide options for students. BI 111 has been taught intermittently in recent years.

BI 105 Introductory Biology for Health Sciences	95-179
BI 106 Human Anatomy	136-234
BI 111 Brains, Hormones & Behavior	19-20
BI 114 Human Infectious Diseases: Aids to TB	87-135
BI 117 Intro Global Ecology (currently inactive)	24-52
BI 119 Sociobiology	33-40

**B. OBLIGATIONS TOWARD GRADUATE EDUCATION.** Taking into account your department's obligations in graduate education *as specified in Step I above*, list specific courses (number and name) and course types that your faculty *should offer* in order to serve students well in allowing them to finish their degrees in a timely way. Every department and program also ought to offer a wider set of courses that enrich the educational program, take advantage of faculty expertise, etc.).

1. Which courses and course types should be offered *every semester*?

Two fall/spring seminar series (2 credits per semester) provide our graduate students an opportunity to present their work to their peers at least once each year. BI 579/580 is for EBE and Marine Biology students; BI 583/584 is for CM and MCBB graduate students.

BI 579/580 Progress EBE & Marine Biol (new, 2 cr each semester)

BI 583/584 Progress in Cell & Molecular Biol (2 cr each semester)

2. Which courses and course types should be offered *annually*?

3. Which courses and course types should be offered *every other academic year or every third year*?

Most of the 400- and 500-level courses listed above serve a dual purpose as required or elective courses in our various graduate programs. Driven in part by undergraduate enrollments, most of these courses should be offered annually. Many of these courses also support interdisciplinary graduate programs (including GPN, Bioinformatics, MCBB, Terrestrial Biogeoscience). Additional courses at the 700-level are for graduate students/programs only.



**Neurobiology:** also supports GPN (all) and MCBB (e.g., 502, 645, 655, 681, 755)

BI 502 Theory of Biological Networks  
BI/NE 520 Sensory Neurobiology  
BI/NE 545 Neurobiology of Motivated Behavior  
BI/NE 554 Neuroendocrinology  
BI 575 Tech Cell Molec Neurobiol (currently inactive)  
BI 594 Topics in Neurobiology: Channelopathies (new in 2012)  
BI 599 Neurobiology of Synapses  
BI/NE 644 Neuroethology (reactivated for Spring 2013 w/ added lab)  
BI/NE 645 Cellular and Molecular Neurophysiology (now w/ lab)  
BI/NE 655 Developmental Neurobiology  
BI/NE 681 Molecular Biology of the Neuron  
BI 755 Cellular & Systems Neuroscience  
BI 756 Systems & Behavioral Neuroscience

**Cell and Molecular Biology:** also supports MCBB (most courses) and other programs as indicated

\*BI 513 Genetics Laboratory (BA/MA Biotech)  
\*BB 522 Molecular Biology Lab (BA/MA Biotech)  
BI 527 Biochemistry Laboratory (2 cr) (7-year Med program, Bioinformatics)  
BI 528 Biochemistry Laboratory (2 cr) (7-year Med program, Bioinformatics)  
BI 551 Stem Cells  
BI 552 Molecular Biology I (MS in Bioinformatics)  
BI 553 Molecular Biology II (Bioinformatics)  
BI 556 Membrane Biochem & Cell Signaling (alt years) (Bioinformatics)  
BI 560 Systems Biology (new in Spring 2013)  
BI 572 Advanced Genetics (alt years) (Bioinformatics)  
BI 576 Carcinogenesis  
BI 610 Cellular Aspects of Develop. & Differentiation  
BI 621 Biochemistry I  
BI 622 Biochemistry II  
BI 625 General Endocrinology (currently inactive)  
BI 642 Physiology & Biochemistry of Reproduction (currently inactive)  
BI 646 Biology of the Cell Cycle  
BI 708 Biochem & Molecular Develop  
MB 721 Grad Biochemistry  
MB 722 Advanced Biochemistry  
BI 735 Advanced Cell Biology  
BI 753 Advanced Molecular Biology

**Ecology, Behavior & Evolution:** supports other programs as indicated

BI 503 Symbiosis  
BI 504 Advanced Evolution  
BI 505 Evolution & Development (currently inactive)  
BI 506 Phenotypic Plasticity  
BI 508 Behavioral Ecology  
BI 515 Population Genetics  
BI 519 Theoretical Evolutionary Ecology

BI/GE 530 Forest Ecology (GE/ES, Terr. Biogeo.)  
 BI 543 Global Ecology (new in Fall 2012) (SED, Global Ecology Education Certificate)  
 BI 549 Molecular Phylogenetics & Evolution (currently inactive)  
 BI 607 Animal Behavior  
 BI 614 Ornithology  
 \*BI 615 Biology of Mammals (currently inactive)  
 BI 616 Herpetology (planned for Spring 2014)  
 BI/ES 643 Terrestrial Biogeochemistry (GE/ES, Terr. Biogeo.)  
 BI 648 Conservation Biology  
 BI 671 Surv EBE & Marine Biol (new in Fall 2012, 2 cr, alt years)  
 BI 686 Sustainability (currently inactive)  
 BI 719 Colloquium in Terrestrial Biogeoscience (2 cr) (Terr. Biogeo.)  
 BI 720 Practicum in Terrestrial Biogeoscience (2 cr) (Terr. Biogeo.)

### STEP III. PLANNING FOR EFFECTIVE, EFFICIENT, EQUITABLE, AND SUSTAINABLE COURSE STAFFING

The core of the process of developing a course roster requires starting with the course rotation needs identified in Step II of this document. Although we develop course rosters from one year to the next, the exercise really requires curricular planning over a longer time period that takes account of the shifting availability of specific faculty and other constraints.

This section of the self-study asks you to devise a plan for staffing your core course rotation needs over the upcoming three-year period. The most straightforward way to do it is to list each course (or type of course, where multiple courses could cover the requirement) for which your department or program has indicated a core need and indicate how your department proposes to cover the obligation over the next three-years (2013/2014, 2014/2015, 2015/2016).

BI 105: Will be taught annually by Dr. Elizabeth Co (starting in 2013)  
 BI 105AC: Will be taught in 2013 by Dr. Elizabeth Co (future years TBD)  
 BI 106: Will be taught annually by Dr. Elizabeth Co (starting in 2013)  
 BI 107: Will be taught annually by Profs. Schneider, Traniello, Wasserman, and Dr. K. Gardner  
 (Director of Instructional Labs), possibly with rotation by other EBE faculty  
 BI 108: Will be taught annually by Profs. Monette and Eldred  
 BI 111: Will be taught annually by Prof. G. Callard  
 BI 114: Will be taught annually by Dr. Elizabeth Co (starting Spring 2014)  
 BI 117: (Zook) Not currently offered.  
 BI 118: Will be taught annually by Profs. Loechler and Dionne  
 BI 119: Will be taught annually by Prof. Traniello  
 BI 203, 213, 281: Will be taught annually by Prof. Cooper, Dr. Ken Adams, and perhaps other  
 Biology faculty  
 BI 206 and BI 282: Will be taught annually by Prof. Celenza.  
 BE 209: This course is offered specifically for BME majors, with the Biology instructional labs staff  
 and graduate teaching fellows responsible for the laboratories only.  
 BI 216: Will be taught annually by Prof. Loechler (meeting with BI 206 for half the semester)  
 BI 211: Will be taught annually by Dr. Elizabeth Co (starting Fall 2012)  
 BI 224: Will be taught annually by Prof. Traniello  
 BI 230: Will be taught annually by Prof. Baum  
 BI 260: Will be taught annually by Prof. Buston

BI 302: Will be taught annually by Prof. Wasserman  
 BI 303: Will be taught every semester by Prof. Finzi and other EBE faculty TBD  
 BI 304: (Patt) Not currently offered.  
 BI 305: Will be taught in years when Prof. Primack is not teaching in KHC  
 BI 306: Will be taught annually by Prof. Templer  
 BI 309: Will be taught annually by Prof. Schneider or Prof. Mullen  
 BI 310: Will be taught annually by Prof. Lobel  
 BI 311: Will be taught annually by new hire in Microbial Ecology (starting Spring 2014)  
 BI 315: Will be taught every semester by Prof. Widmaier  
 BI 325 (NE 203 lecture): Will be taught every semesters by Profs. Dionne and Ho, or Prof. Lin  
 BI 385: Taught by Prof. Hausman in Fall 2013; Prof. Siggers and/or Dr. Co may teach in future years  
 BI 403: Will be taught annually by Prof. Hausman  
 BI 407/607: Will be taught annually by Prof. Wasserman  
 BI 410/610: Will be taught annually by Prof. Bradham  
 BI 414/614: Will be taught in alternate years by Prof. Wasserman  
 BI 415/615: (Kunz) Not currently offered.  
 BI 416/616: Will be taught in alternate years by Profs. Schneider and Warkentin (starting Spring 2014)  
 BI 421/621: Will be taught annually by Prof. Tolan  
 BI 422/622: Will be taught annually by Prof. Kornberg  
 BI 425/625: (IP Callard) Not currently offered.  
 BI 438, 439, 440, 441: Tropical Ecology Program in Ecuador – all courses by Dr. Kelly Swing  
 BI 442/642: (IP Callard) Not currently offered.  
 BI 443/643: Will be taught in alternate years by Prof. Finzi  
 BI 444/644: Will be taught in alternate years by Prof. Gardner  
 BI 445/645: Will be taught annually by Prof. Lin  
 BI 446/646: Will be taught annually by Prof. Monette  
 BI 448/648: Will be taught annually by Prof. Primack  
 BI 455/655: Will be taught annually by Prof. Man  
 BI 481/681: Will be taught in alternate years by Prof. Ho  
 BI 486/686: (Kaufman) Not currently offered.  
 BI 502: Will be taught in alternate years by by Prof. Gardner  
 BI 503: Will be taught annually by Prof. Zook (SED)  
 BI 504: Will be taught in alternate years by Prof. Mullen or Prof. Schneider.  
 BI 505: (Finnerty) Not currently offered.  
 BI 506: Will be taught in alternate years by Prof. Warkentin  
 BI 508: Will be taught in alternate years by Prof. Sorenson  
 BI 513: Will be taught annually by Prof. Celenza  
 BI 515: Will be taught in alternate years by Prof. Sorenson or Prof. Mullen  
 BI 519: Will be taught in alternate years by Prof. Buston  
 BI 520: Will be taught annually by Prof. Davison  
 BB 522: Will be taught annually by Prof. Gilmore  
 BI 527: Will be taught annually by Prof. Tolan  
 BI 528: Will be taught annually by Prof. Kornberg  
 BI 530: Will be taught annually by Prof. Templer  
 BI 531: Will be taught annually by Prof. Lobel  
 BI 539: Will be taught in alternate years by Prof. Kaufman

BI 543: Will be taught annually by Prof. Zook (SED)  
BI 545: Will be taught annually by Prof. Baum  
BI 546: Will be taught annually by Prof. Kaufman  
BI 547: (Finnerty) Not currently offered (replaced by BI 569)  
BI 549: (Sorenson/Schneider) Not currently offered.  
BI 550: Will be taught annually by Prof. Finnerty  
BI 551: Will be taught annually by Prof. Frydman  
BI 552: Will be taught annually by Prof. Loechler  
BI 553: Will be taught annually by Prof. Naya  
BI 554: Will be taught annually by Prof. G. Callard  
BI 556: Will be taught in alternate years by Prof. Waxman  
BI 55x: Will be taught annually by Prof. Siggers  
BI 563: Will be taught annually by Prof. Atema  
BI 569: Will be taught annually by Prof. Finnerty  
BI 572: Will be taught in alternate years by Prof. McCall  
BI 575: (Lin/Wachowiak) Not currently offered.  
BI 576: Will be taught in alternate years by Profs. McCall and Gilmore  
BI 579/580: Will be taught annually by EBE faculty  
BI 583/584: Will be taught annually by Prof. Gilmore or other CM faculty  
BI 594: Will be taught annually by Prof. Dionne  
BI 599: Will be taught annually by Prof. Man or Prof. Davison  
BI 671: Will be taught in alternate years by Prof. Buston or other EBE faculty  
BI 708: Will be taught annually by Prof. Hausman  
BI 719: Will be taught annually by Prof. Finzi or Templer in rotation with E&E faculty in alt years  
BI 720: Will be taught annually by Prof. Finzi or Templer in rotation with E&E faculty in alt years  
MB 721: Will be taught annually by Prof. Kornberg  
MB 722: Will be taught annually by Prof. Tolan  
BI 735: Will be taught annually by Prof. Bradham  
BI 753: Will be taught annually by Prof. Hansen  
BI 755: Will be taught annually by Prof. Eldred w/ possible rotation by other neurobiology faculty  
BI 756: Will be taught annually, currently by neuroscience faculty outside of Biology.

CC 106: We plan to continue providing 2 Biology faculty members to this course. In Spring 2013, Profs. Schneider and Atema will teach the course. In Spring 2014, Profs. Atema and Mullen will teach the course.

WS 101: Prof. Warkentin is participating in a new Women's, Gender & Sexuality Studies course and will continue with this course on an annual basis.

KHC BI 101, BI 102, HC 301: Profs. Primack and Kaufman will teach for KHC in alternate years.

Further notes for developing your plan:

1. The quality of the educational experience for both undergraduates and graduates is of prime concern. For undergraduates the first-year experience has a major impact on the likelihood that they will succeed and flourish through their academic experience. Wherever possible, faculty should be involved in students' academic experience of their first years at college as well as their later ones.
2. All faculty should participate in sharing the core elements of the curricular obligations of the department.

3. Faculty workloads should be distributed as equitably as possible in terms of sharing core elements of the curricular obligations of the department, class sizes, course level (introductory, advanced, graduate) and, in addition, in consideration of graduate student and undergraduate advising loads. New assistant professors should be given consideration in being able to repeat courses while developing a full repertoire of courses, and more senior faculty are not exempt from developing the ability to share in new curricular obligations.
4. Faculty should not “own” particular courses; if a new faculty member has core expertise in an area that has been taught repeatedly by someone else for many years, develop a plan for rotation.
5. Recent years’ enrollments will be useful in developing both this three-year plan and the specific roster of courses you compile in any given year. Courses that have recently enrolled very few students should be taught less often. Departments with relatively few majors should stretch to serve more College and University curricular needs.

#### **STEP IV: EXECUTIVE SUMMARY OF UPDATES AND TEN-YEAR PLANNING**

1. UPDATES: Please list all major updates that you made to this document this year.

##### New courses AY 2012/2013:

- BI 520 Sensory Biology – course resurrected for Fall 2011 by Prof. Dionne. New faculty member Ian Davison has taken over responsibility for this course in Fall 2012 and will continue with it on an annual basis.
- BI 543 Global Ecology (Zook, SED) – offered for the first time in Fall 2012 in support of SED Certificate in Global Ecology Education.
- BI 560 Systems Biology – new course offered by Prof. Siggers for the first time in Spring 2013; course fills an important need in the cell and molecular biology curriculum.
- BI 579/580 Progress in Ecology, Behavior, Evolution and Marine Biology – offered for the first time in AY 2013/2014 – provides venue for annual research presentations by graduate students, emulating long-standing BI 583/584 sequence for CM students.
- BI 594 Topics in Neurobiology: Channelopathies: When Ion Channels Go Bad – new topic for this advanced neurobiology course offered by Prof. Dionne in Fall 2012 for the first time in many years.
- BI 671 (2 cr.) Survey of Ecology, Behavior, Evolution and Marine Biology – taught by Prof. Buston for the first time in Fall 2012; provides EBE/Marine Biology graduate students with an introduction to the range of current research in the department.

##### Reactivated courses for Spring 2013:

- BI 310 Comparative Vertebrate Anatomy – not taught in 2011 or 2012; reactivated by Prof. Lobel for Spring 2013.
- BI 444 Neuroethology – not taught since Fall 2009; reactivated by Prof. Gardner for Spring 2013 with the addition of a laboratory section.

##### New courses for AY 2013/14:

- BI 403 Cell Physiology & Structure – new course developed by Prof. Hausman tentatively planned for Fall 2013.
- BI 416/616 Herpetology – this new course will be offered for the first time in Spring 2014 by Profs. Schneider and Warkentin and then in alternate years.

Currently inactive courses that would ideally be included in the curriculum (courses marked with an asterisk are new to this list):

- \*BI 117 Intro to Global Ecology (Zook)
- BI 304 Morphogenesis (Patt)
- \*BI 305 Plant Biology (Primack)
- \*BI 415/615 Biology of Mammals (Kunz)
- \*BI 425/625 General Endocrinology (IP Callard)
- \*BI 442/642 Physiology & Biochemistry of Reproduction (IP Callard)
- \*BI 486/686 Sustainability (Kaufman)
- BI 505 Evolution & Development (Finnerty)
- BI 549 Molecular Phylogenetics & Evolution (Schneider, Sorenson)
- BI 575 Techniques in Cell Molec Neurobiol (Lin, Wachowiak)

Newly inactive courses not likely to be offered in the future:

- BI 512 Mammalian Ecology (Kunz)
- BI 532 Ichthyology 2 (Lobel)

Other changes to existing courses:

- BI 385 was moved to Fall semester and Prof. Hausman replaced Prof. Godrick in this course; plans for the future of this course are uncertain
- Profs. Schneider and Atema will teach in the core (CC106) in Spring 2013 (Atema replacing Mullen), with Prof. Mullen rotating back in for Prof. Schneider in Spring 2014.

2. GOALS AND PLANNING: With continuing reference to the three preceding sections of this Self-Study, please discuss significant changes, beyond those already documented above, that your unit is planning or that you foresee occurring over the next three years, and assess the potential impact of those changes on the scope and quality of academic programs.

A. The Curricular Context: How will your unit's set of commitments and priorities in undergraduate and graduate education evolve (include enrollment projections in cases where you foresee a substantial change in student numbers)?

The Biology faculty supports a broad range of courses that serve both undergraduate and graduate students in Biology as well as students in a variety of interdisciplinary programs. The diversity of programs that we serve can generate competing demands on faculty time and a challenge as we continue to evaluate our curriculum and seek opportunities to update and expand our course offerings. Faculty with interests in Marine Biology/EBE, in particular, are engaged in a broad range of teaching responsibilities, including the Core Curriculum, Kilachand Honors College, Marine Science, Terrestrial Biogeosciences, and Women's, Gender & Sexuality Studies. All of these efforts have impacted our ability to offer upper-level courses for Biology majors and graduate students.

Likewise, a robust curriculum in neurobiology, which serves both Biology students and Neuroscience students, is increasingly important as student interest in this field grows. This is an important area for growth as new faculty members are hired to replace recent departures in this field.

At present, the cell and molecular biology curriculum, which also serves interdisciplinary programs

at both the undergraduate (BMB, Biotechnology) and graduate (MCBB, Bioinformatics) level, has had the greatest stability and will be improved with the addition of a new course in systems biology.

Upcoming retirements will continue to present new challenges for staffing courses, but also an opportunity to update and refresh our curriculum in key areas. There will be a need for our junior faculty to increase their contributions to introductory and core undergraduate courses.

List any academic programs that you are currently proposing/developing/reviewing/revising or planning to propose/develop/review/revise, either within your department or in collaboration with other units of the College and University.

N/A

Please take advantage of this opportunity not only to think about new initiatives and growth areas, but also to assess the costs and benefits of any degree programs or minors currently offered or staffed by your unit that enroll small numbers of students. List those programs/minors here, and in each case say why the program should be continued as is, strengthened, absorbed as a track within some larger program, or discontinued to free up teaching and advising capacity for higher priorities.

Note: The future of low-enrollment programs will be a particular focus of our follow-up discussions with you.

B. Specific Course Needs: In what significant ways will the changes listed in "A" above affect the courses (kind, size, format, offering patterns) you will need to offer?

Development of new courses in coming years will reflect increasing interest and faculty expansion in neuroscience, systems/integrative biology, genomics, and quantitative biology (including theory), both within the department and in other units. Faculty in these research areas will be involved in teaching at both the undergraduate and graduate levels, serving both the department and interdisciplinary programs in these areas. We have made some progress in expanding course offerings in Neurobiology and EBE with the recent additions of Profs. Gardner, Buston, Mullen, Davison, and Siggers.

The Marine Science program, and particularly the marine semester, is continuing to evolve. At least in the short term, the addition of block courses during the marine semester has drawn faculty away from teaching upper division courses in EBE; it will be important for the Marine Program to continue working towards a larger menu of course offerings across participating departments to allow some degree of rotation in and out of the marine semester.

During the past year, the Biology faculty completed deliberations and settled on requirements for our departmental honors program, which will emphasize research rather than coursework. As such, the need to develop additional "honors" courses is less urgent, but in the future we would like to offer intensive, introductory courses in EBE and Neurobiology to complement an existing sequence of intensive courses in cell and molecular biology (BI 118, BI 213, BI 216). At present, such offerings are not possible given competing demands on faculty time (EBE) and/or the limited number of current faculty (Neuro).

C. Course Staffing: How do you see the next ten years of turnover and renewal affecting the composition and profile of your faculty? Please think especially of how you will use replacement positions to build areas of new or continuing high priority in research and teaching. How will these changes affect your planning for the implementation of current and future curricula?

1) Retirements: The most significant challenge for the department in the coming years is to manage the staffing of our existing courses as a number of faculty members retire. Five faculty members are officially retiring at the end of AY2012/13; in addition, Prof. Kunz is unlikely to return to work and other faculty members may soon retire or transition to reduced teaching loads in advance of retirement. A new full time lecturer (Elizabeth Co) is already helping us address this challenge, but additional changes in the staffing of many of our large undergraduate courses will be needed.

As of 2013/14, Dr. Co will handle four large lecture courses previously taught by Profs. Godrick and Patt. These include:

BI 105: Introductory Biology for the Health Sciences (Godrick)

BI 106: Human Anatomy (Patt)

BI 114: Human Infectious Diseases: Aids to TB (Godrick)

BI 211: Human Physiology (Patt)

She will also teach BI 105AC in Spring 2013 and may continue with that course as an overbase assignment in subsequent years.

Plans for other courses taught by retiring faculty are as follows:

- BI 310: Comparative Vertebrate Anatomy (Patt) – this course is being taught by Prof. Lobel in Spring 2013, he will likely be on sabbatical in Spring 2014, but may teach the course again in subsequent years.
- BI 303: Ecology (Kunz) – we have been offering BI 303 every semester for at least the past 7 years. For AY 2012/13, Dr. Nathan Stewart was hired to teach both semesters, as Prof. Finzi is on sabbatical in Spring 2013. For AY 2013/14, we will need to hire a temporary instructor again or offer BI 303 in one semester only, which may create challenges for the scheduling of lab sections.
- BI 311: Microbiology (Golubic) – we anticipate that a new faculty member working in Microbial Ecology (current faculty search) will teach a revised and significantly updated version of BI 311 starting in Spring 2014.
- BI 385: Immunology (Godrick) – Prof. Hausman is teaching this course in Fall 2012, but plans for subsequent years are uncertain. Dr. Co and Prof. Siggers have expertise in this area but are currently engaged in teaching other courses.

With recent retirements, we have lost a range of advanced electives, a few of which have been replaced by new course offerings developed by new members of the faculty. Other courses remain inactive (see list above) due to the current round of retirements and competing demands on faculty time, which has affected the EBE curriculum in particular.

2) AY 2013/2014 sabbaticals: A short-term challenge that remains unresolved is the staffing of three essential courses in the EBE curriculum during AY 2013/14, including BI 306 and BI 448, which are taught by faculty members who will be on sabbatical, and one semester of BI 303, which has been taught by Prof. Kunz. We also expect to have a bare minimum of advanced electives in EBE fields during AY 2013/14, offering only 6 courses per semester at the 200-level and above rather than our usual 7-9 courses.



*Thank you for taking the time to engage in this exercise. It will help us serve our students and faculty better. We will take account of the responses in responding to specific proposals, requests for temporary lecturers, and requests for new and replacement faculty positions. We will also use the self-study as one basis for continuing discussions in the College about strategic planning.*