



**EXECUTIVE VICE PRESIDENT AND PROVOST**  
**THE UNIVERSITY OF TEXAS AT AUSTIN**

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November 24, 2015

Dr. Steven Leslie  
Executive Vice Chancellor for Academic Affairs  
The University of Texas System  
P4300

Dear Dr. Leslie:

Enclosed for your consideration and approval are proposed changes to the Bachelor of Science and Arts Degree Program in the College of Natural Sciences chapter in the *Undergraduate Catalog, 2016-2018* (D 13468-13477). Faculty Council approved this proposal on November 11, 2015. Final approval resides with UT System.

Sincerely,

A handwritten signature in blue ink, appearing to read "Judith", written over the printed name.

Judith H. Langlois  
Executive Vice President and Provost, *ad interim*

JHL: lac

Enclosure

cc: Gregory Fenves, President  
Carol Longoria, Assistant Deputy to the President  
David Vanden Bout, Associate Dean, College of Natural Sciences  
Judith Quinney, Manager, Records Office, College of Natural Sciences  
Brenda Schumann, Associate Registrar  
IRRIS Team  
Hillary Hart, Secretary, General Faculty and Faculty Council  
Deborah Roberts, Executive Assistant, OGF  
Victoria Cervantes, Senior Administrative Associate, OGF



OFFICE OF THE FACULTY COUNCIL

THE UNIVERSITY OF TEXAS AT AUSTIN

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November 12, 2015

Judith H. Langlois  
Interim Executive Vice President and Provost  
The University of Texas at Austin  
MAI 201  
Campus Mail Code: G1000

Dear Dr. Langlois:

Enclosed for your consideration and action proposed changes to the Bachelor of Science and Arts Degree Program (D 13468-13477) in the College of Natural Sciences chapter in the *Undergraduate Catalog, 2016-2018*. The proposal was classified as being of *general* interest to more than one college or school and was approved by the Faculty Council on a no-protest basis on November 11, 2015. The authority to grant final approval resides with UT System.

Please let me know if you have questions or if I can provide other information concerning these items.

Sincerely,

Hillary Hart, Secretary  
General Faculty and Faculty Council

HH:dlr

Enclosure

xc: Gregory L. Fenves, president  
Janet Dukerich, senior vice provost

ec (letter only): Carol Longoria, deputy to the president  
David Vanden Bout, associate dean for curriculum and programs, College of Natural Sciences  
Judith Quinney, manager, records office, College of Natural Sciences  
Allen Walser, manager of reporting and analysis, IRRIS  
Brenda Schumann, associate registrar  
Lydia Cornell, program coordinator, provost's office  
Michelle George, administrative manager for faculty affairs, provost's office

## DOCUMENTS OF THE GENERAL FACULTY

**PROPOSED CHANGES TO THE BACHELOR OF SCIENCE AND ARTS DEGREE PROGRAM IN  
THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE CATALOG 2016-  
2018***

Dean Linda Hicke, in the College of Natural Sciences has filed with the secretary of the Faculty Council the following changes to the Bachelor of Science and Arts degree program in the *Undergraduate Catalog, 2016-2018*. On March 26, September 18, March 4, and September 15, the Departments of Biochemistry, Biology, Computer Science, and Neuroscience approved the proposal, respectively. On September 28, 2015, Associate Dean David Vanden Bout approved it on behalf of the college and the dean. The secretary has classified this proposal as legislation of *general* interest to more than one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the changes on October 22, 2015, and forwarded them to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with UT System.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by November 11, 2015.



Hillary Hart, Secretary  
General Faculty and Faculty Council

PROPOSED CHANGES TO THE BACHELOR OF SCIENCE AND ARTS DEGREE PROGRAM IN  
THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE CATALOG 2016-  
2018*

**Type of Change**      ☒ Academic Change  
☐ Degree Program Change (THECB form required)

**Proposed classification**    ☐ Exclusive    ☒ General    ☐ Major

1. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT, TO DETERMINE IF SACS-COC APPROVAL IS REQUIRED.

- Is this a new degree program? Yes ☐ No ☒
- Does the program offer courses that will be taught off campus? Yes ☐ No ☒
- Will courses in this program be delivered electronically? Yes ☐ No ☒

2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE:

### Language, Arts, and Culture Requirement

- Language, Arts, and Culture Requirement
1. Addition of the Creative Writing field of study under the Humanities section.  
**Rationale:** The college wants to formally add CRW to the Humanities section. It is a close cousin to the fields of English and Rhetoric and Writing that are already included in the Humanities section. Over the past year, a handful of students have petitioned courses from this field of study.
  2. Move art history from the Humanities section to the Fine Arts section.  
**Rationale:** The faculty on the Committee on Undergraduate Degree Program Review pointed out that art history seemed to fit better under Fine Arts, mirroring the home of the field of study at UT Austin. The college has no objection to moving art history.
  3. Allow up to six hours of credit by examination to be used toward the Language, Arts, and Culture requirement.  
**Rationale:** The Language, Arts, and Culture requirement was written to prohibit use of credit by examination. The college received complaints from students who felt they were encouraged by high schools and colleges to test out of as many requirements as possible. Allowing up to six hours toward the Language, Arts, and Culture requirement is a compromise that will ensure at least half of the requirement will be completed in college classrooms. It will also minimize the impact on students who tested out and claimed advanced placement that cannot be applied. It will be easier to absorb six hours into elective credit than twelve hours. The compromise also assists students attempting to qualify for tuition rebates and loan programs that restrict the number of hours above the degree total that a student may attain and remain eligible.
  4. Definition of how many courses in intermediate and advanced foreign language may count toward the Language, Arts, and Culture requirement.  
**Rationale:** Some native or heritage speakers of foreign languages begin taking foreign language at the intermediate or advanced level. Some of these students want to count the equivalent number of courses, or hours needed to obtain one-year proficiency toward the requirement (i.e. count six hours of advanced coursework toward the requirement). The college wants to count only one intermediate or advanced course toward the Language, Arts, and Culture requirement to represent attainment of one-year proficiency in a foreign language. This statement clarifies how intermediate and advanced foreign language courses will apply toward the requirement.

### Major Requirement

Major Requirement  
Define the major as consisting of the mathematics, primary science, and secondary science components.

**Rationale:** Students and advisors experienced confusion in determining how much coursework in the major requirements section could overlap with a transcript-recognized certificate. By explicitly defining the major, the college will eliminate this confusion.

#### Minor or Certificate Requirement

1. Rename the Minor or Certificate Requirement as the Additional Requirement.

**Rationale:** The word minor may only be used in association with the transcript-recognized minor credential. The college will use the term "additional requirement" as an umbrella term for either a transcript-recognized credential or fifteen hours in a single field of study.

2. Addition of pharmacy and nursing as two colleges/schools that may not be used for the transcript-recognized minor or fifteen hours in a single field of study.

**Rationale:** Students who transferred from nursing or were admitted to pharmacy have used clinical coursework toward the fifteen hours in a single field of study. This does not meet the spirit of the requirement.

#### Special Requirements

Group all degree restrictions together in one section. Clarify requirement overlaps in an explicit manner. Allow up to six hours of overlap between the major and a transcript-recognized certificate. The remainder of the changes gathers this information in one place. Increase upper-division in the major in residence from six to nine hours.

**Rationale:** Students, advisors, and college administrators made different assumptions about how requirements in the BSA may overlap. By explicitly prohibiting overlaps except for specific situations, and by grouping all of these requirements into a single section, students, advisors, and college administrators will have the same resource to consult regarding possible course overlaps. Faculty in one department became concerned that their BSA majors may attempt to transfer the majority of their upper-division from other universities. The departments agreed to increase the upper-division in the major in residence in support of

#### Biochemistry

1. Update calculus requirement to M 408C or 408N and 408S.

**Rationale:** M 408N and 408S in combination are equivalent to 408C.

2. Require 1 semester of advanced chemistry, chosen from physical chemistry (353M) or analytic chemistry (455).

**Rationale:** One of these courses is needed to ensure BSA students are qualified to become practicing biochemists.

#### Biology

1. Update of calculus requirement to add M 408R, and to require both M 408N and 408S. Addition of statement to clarify that M 408R is a terminal course and may not be used as a prerequisite to other calculus courses.

**Rationale:** The change was made to standardize mathematics required across all biology degrees so that students could more easily change their minds about which option to pursue without retaking different introductory courses specific to an individual degree.

2. Removal of BIO 373 as an alternative to BIO 370.

**Rationale:** Like Genetics, every biology degree holder should have a thorough understanding of evolution, as such knowledge is necessary for every other upper-division course.

3. Change major from 9 hours of upper-division biology, including coursework from three of the four areas, and including a lab, to one upper-division course from each of four lists, including one upper-division lab.

**Rationale:** This change was made to conform with all of the biology degrees that have a breadth requirement. The course area designations were updated to reflect modern ways of thinking about biology education.

4. Reduce additional biology requirements to the first half of a calculus-based physics sequence.

**Rationale:** The change was made to standardize physics required across all biology degrees so that students could more easily change their minds about which option to pursue without retaking different introductory courses specific to an individual degree.

### Computer Science

1. In requirement 1a, add M 408S.  
**Rationale:** the Department of Statistics and Data Sciences intends to change the SDS 321 prerequisite to M 408C or 408N and 408S.
2. In requirement 1b, note that M 341, Linear Algebra and Matrix Theory, may be applied as substitute to M 340L, Matrices and Matrix Calculations, or SDS 329C, Practical Linear Algebra I.  
**Rationale:** M 341 cannot be added directly to the requirements because it requires completion of more calculus than is required for the BSA CS major. Instead, it is noted as a substitute. M 341 is similar in content and spirit to M 340L and SDS 329C. Students in the BS in Computer Science degree may currently count M 341 toward this requirement. This notation will allow students to count M 341 without filing a petition.
3. In requirement 1c, note that M 362K, Probability I, may be applied as a substitute to SDS 321, Introduction to Probability and Statistics.  
**Rationale:** M 362K cannot be added directly to the requirement because the prerequisite consists of more calculus than is required for the BSA CS major. Instead, it is noted as a substitute. M 362K is similar in content and spirit to SDS 321. Students in the BS in Computer Science degree may currently count M 362K toward this requirement. This notation will allow students to count M 362K without filing a petition.
4. In requirement 3a, remove astronomy, geological sciences, and marine science as options for the six-hour, majors-level requirement.  
**Rationale:** Geosciences has restricted enrollment access to most of its courses for geosciences majors. computer science majors who want to study geological sciences are usually able to enroll in the first course of a two-course sequence. The students have extreme difficulty enrolling in a second course that is designed for science majors. Beyond AST 307, students have a difficult time getting a second astronomy course that may be counted toward a degree in natural sciences.  
 Marine science courses are typically small in nature, and are not offered in a consistent instructional rotation. Students have a difficult time completing the sequence.
5. Add repetition and enrollment restrictions for computer science coursework. These restrictions are published in the Special Requirements section of the BS in Computer Science.  
**Rationale:** These restrictions were omitted from the BS degree, CS major, 2014-16 catalog, in error. Students who make grades of *Q*, *D*, *F*, and *CR* in a computer science course must request permission to repeat the class. Students may not repeat a computer science course more than twice. Students may not enroll in more than three upper-division computer science courses in a single semester without permission. These policies provide opportunities for intervention to assist students in being successful in their second and final computer science course attempts. The enrollment restriction is necessary due to the large amount of project work in each upper-division course. The policy requires students to balance their upper-division coursework. The policy also prevents seniors from enrolling in five upper-division CS courses with the intention of dropping two courses. This particular strategy took seats away from rising seniors, and created a false sense of demand for more seats/sections.

### Neuroscience

1. Removal of NEU 365R as an option to NEU 330.  
**Rationale:** NEU 365R is our service course and has been removed as a prerequisite for other neuroscience upper-division courses. We want all students majoring in neuroscience to take NEU 330, the first of the two core introductory courses in the field.
2. Addition of several NEU courses to the list of approved coursework in requirement 2d.  
**Rationale:** Some new courses have been developed and we wish to add them to the list of electives for students. We have included the neuroscience lab courses as options. BSA neuroscience majors may enroll in upper-division lab courses if there is room.
3. Addition of BIO 325.  
**Rationale:** Neuroscience faculty decided that BIO 325, Genetics, should be required for students in this major.
4. Exchange of positions of approved physics sequences (PHY 317K and 301 sequences).

**Rationale:** Student tend to take the first set of courses they see listed, and we would prefer they take the PHY 317K sequence because it focuses more on biomedical applications.

#### Physics

Add M 427J as an alternative to M 427K.

**Rationale:** M 427J will be taught in regular rotation, and contains most of the M 427K material, along with some linear algebra content.

### 3. THIS PROPOSAL INVOLVES (Please check all that apply)

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Courses in other colleges                    | <input type="checkbox"/> Courses in proposer's college that are frequently taken by students in other colleges  | <input type="checkbox"/> Flags   |
| <input type="checkbox"/> Course in the core curriculum                           | <input type="checkbox"/> Change in course sequencing for an existing program  | <input checked="" type="checkbox"/> Courses that have to be added to the inventory |
| <input type="checkbox"/> Change in admission requirements (external or internal) | <input checked="" type="checkbox"/> Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office) | NEU 367W to replace BIO 367W   |
|  |   | NEU 371M to replace BIO 371M   |

### 4. SCOPE OF PROPOSED CHANGE

- a. Does this proposal impact other colleges/schools? Yes ☒ No ☐  
 If yes, then how?  
 1) By disallowing minors in the College of Pharmacy and the School of Nursing, a handful of students will need to make other choices for the additional requirement if seeking a minor or 15 hours in a single field of study. Since they are students who completed 15 hours of Pharmacy or Nursing prior to seeking the Bachelor of Science and Arts, there is no impact to these colleges.  
 2) The college has approved a handful of petitions to count courses in the Creative Writing field of study toward the Language, Arts, and Culture requirement. Adding the CRW field of study will eliminate the need for petitions. We do not anticipate an increase in Natural Sciences majors taking Creative Writing courses.  
 3) Computer Science is dropping geological sciences from its science requirement options. See details below.
- b. Do you anticipate a net change in the number of students in your college? Yes ☐ No ☒  
 If yes, how many more (or fewer) students do you expect?
- c. Do you anticipate a net increase (or decrease) in the number of students from outside of your college taking classes in your college? Yes ☐ No ☒  
 If yes, please indicate the number of students and/or class seats involved.
- d. Do you anticipate a net increase (or decrease) in the number of students from your college taking courses in other colleges? Yes ☐ No ☒  
 If yes, please indicate the number of students and/or class seats involved.
- If 4 a, b, c, or d was answered with yes, please answer the following questions. If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.**
- How many students do you expect to be impacted? 4 seats in GEO 401 and 4 or less seats across other geological sciences courses per academic year.
- Impacted schools must be contacted and their response(s) included:  
 Person communicated with: M. Nicole Evans, Assistant Dean, Jackson School of Geosciences  
 Date of communication: April 16, 2015  
 Response: Doug, Yes, JSC is fine with this change.
- e. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? No. If yes, explain:

If yes, undergraduate studies must be informed of the proposed changes and their response included:

Person communicated with:

Date of communication:

Response:

- f. Will this proposal change the number of hours required for degree completion? No. If yes, explain:

## 5. COLLEGE/SCHOOL APPROVAL PROCESS

Department approval date: Biochemistry: March 26, 2015  
 Biology: April 6, 2015; August 28, 2015; September 18, 2015  
 Computer Science: March 4, 2015  
 Neuroscience: April 28, 2015; September 16, 2015  
 College approval date: General degree requirements: September 16, 2015  
 Biochemistry: April 8, 2015  
 Biology: May 27, 2015; September 2, 2015; September 28, 2015  
 Computer Science: May 20, 2015  
 Neuroscience: September 9, 2015; September 23, 2015  
 Dean approval date: September 28, 2015, David Vanden Bout, Associate Dean

## PROPOSED NEW CATALOG TEXT:

### Bachelor of Science and Arts

The requirements for the bachelor of science and arts degree are designed to give each student an opportunity to combine a core mathematics or science experience with an interdisciplinary curriculum which complements his or her major. Students pursuing the Bachelor of Science and Arts will major in a discipline within the College of Natural Sciences ~~[as well as minor]~~ and complete one of the following: a transcript-recognized minor, transcript-recognized certificate, or fifteen hours in a single field of study. This will ~~[which]~~ allow[s] the student to explore applications of his or her major in the broader society, allows the student to see the impacts of the sciences in other fields of study, and develops a complementary expertise, which supports multidisciplinary study.

All students pursuing an undergraduate degree must complete the University's Core Curriculum. The prescribed work requirements for the Bachelor of Science and Arts consist of the University's Core Curriculum, college flag requirements, language, arts, and culture requirement, major requirements, ~~[minor or transcript-recognized certificate]~~ additional requirement[s], and electives. ~~[Students may not use a course in one area of prescribed work to fulfill the requirements of another area of prescribed work; the only exception to this rule is that a course that fulfills one requirement may also be used to fulfill a flag requirement. Courses used to fulfill prescribed work requirements may be used to fulfill the University core curriculum requirements except where expressly prohibited.]~~

In the process of fulfilling the core curriculum and other degree requirements, all students must complete courses with content in the following areas:

1. Writing: two flagged courses, including one at the upper-division level, beyond Rhetoric and Writing 306 or its equivalent
2. Quantitative reasoning: one flagged course

~~[Students pursuing a Bachelor of Science and Arts must fulfill both the University general requirements for graduation and the requirements of the College of Natural Sciences. These include a University grade point average of at least 2.00 in all courses taken at the University (including credit by examination, correspondence, and extension), and a grade of at least C- in all math and science courses required in the major. Students completing a transcript-recognized certificate program must meet the minimum grade requirements and grade~~



~~point average requirements of the program. Students must also complete a minimum of sixty hours in residence at the University, including at least eighteen hours of the major in residence.]~~

Students may earn an honors major in their fields of study upon graduation by completing the following requirements:

1. Good standing in the Health Science Honors Program or the University Fellows Program.
2. A section of Undergraduate Studies 302 or 303 that is approved by the departmental honors adviser.
3. Six hours of coursework in the major must be at the honors-level.
4. Natural Sciences 371.
5. A University grade point average of at least 3.50.

#### Prescribed Work Common to All Majors

1. Language, Arts, and Culture Requirement

Twelve hours selected from at least two of the following four areas:

- a. *Fine arts*: courses chosen from design, ensemble, fine arts, music, studio art, performance, visual art studies, art history, and theatre and dance.
- b. *Humanities*: courses chosen from American studies, ancient history and classical civilization, ~~[art history,]~~ classical civilization, comparative literature, creative writing, English, humanities, philosophy, religious studies, and rhetoric and writing.
- c. *Social and behavioral sciences*: courses chosen from anthropology, economics, geography, government, history, linguistics, psychology, and sociology.
- d. *Foreign language and culture*: foreign language courses or culture courses chosen from an approved list available in the college advising centers. Students who elect to pursue a foreign language must ~~[minimally]~~ complete a one-year competency. Students who complete intermediate or advanced level foreign language courses rather than courses equivalent to beginning level competency may count only one intermediate or advanced course toward the language, arts, and culture requirement.

~~[Courses used to satisfy the University core curriculum, or credit earned by examination, may not be used to satisfy this requirement.]~~ A maximum of six semester hours earned through credit by examination may count toward the language, arts, and culture requirement.

2. ~~[1-]~~ Major Requirements  
The specific courses required for the major vary with the major selected and are described in the links to the right. Unless the requirements of the major state otherwise, a major consists of at least thirty-six but no more than forty-nine semester hours. The major consists of the mathematics, primary science, and secondary science requirements.
3. ~~[2-Minor or Certificate]~~ Additional Requirement  
The Bachelor of Science and Arts requires the completion of ~~[all requirements for]~~ one of the following: a transcript-recognized minor, transcript-recognized certificate, or [program or a minor. A minor consists of at least] fifteen hours in a single field of study. [that is] Students who complete a transcript-recognized minor or fifteen hours in a single field of study must select a minor or field of study that is outside the College of Natural Sciences, College of Pharmacy, Cockrell School of Engineering, [and] Jackson School of Geosciences, and School of Nursing. [A student may not pursue a certificate that requires more than three hours of coursework required in the major, or more than six hours of coursework in their major field of study.]
4. ~~[2-]~~ Electives  
Enough additional coursework to make a total of 120 semester hours.

#### Special Requirements

1. Students may not use a course counting toward one area of prescribed work to fulfill the requirements of another area of prescribed work unless expressly permitted as follows:
  - a. Courses counting toward the university core curriculum may also count toward the major requirements, the additional requirement, and electives.
  - b. Courses counting toward the university core curriculum writing flag may also count toward the language, arts, and culture requirement.

- c. Courses counting toward the college flag requirements may also count toward the university core curriculum, language, arts, and culture requirement, major requirements, additional requirement, and electives.
- d. A maximum of six hours may overlap between the major and a transcript-recognized certificate
- 2. Students who seek a transcript-recognized minor or transcript-recognized certificate must meet the minimum grade requirements and grade point average requirements of the program.
- 3. Students must earn a University grade point average of at least 2.00 in all courses taken at the University (including credit by examination, correspondence, and extension), a grade of at least C- in each mathematics and science course counted toward the major, and a grade point average of at least 2.00 in the courses fulfilling the major.
- 4. Students must complete a minimum of sixty hours in residence at the University, including at least eighteen hours of the major. The eighteen hours of the major in residence must include at least nine hours of advanced coursework.

## Astronomy

[no changes]

## Biochemistry

### Major

- 1. Mathematics:
  - a. Mathematics 408C or 408N and 408S.
  - b. Statistics and Data Sciences 328M.
- 2. Primary science:
  - a. Chemistry 301 or 301H, 302 or 302H, and 204.
  - b. Chemistry 320M, and 353M or 455.
  - c. Biochemistry 339F and 369L.
  - d. Two courses chosen from the following: Biochemistry 339J, 339M, 339N, and 370.
- 3. Secondary science:
  - a. Biology 311C, 311D and 325, or Biology 315H and 325H.
  - b. One of the following physics sequences:
    - i. Physics 317K, 117M, 317L, and 117N (recommended).
    - ii. Physics 301, 101L, 316, and 116L.
    - iii. Physics 303K, 103M, 303L, and 103N.

## Biology

### Major

- 1. Mathematics:
  - a. Mathematics 408C, 408R, or 408N and 408S. Students who intend to take additional calculus coursework should begin the sequence with 408C or 408N.
  - b. **Statistics and Data Sciences 328M.**
- 2. Primary science:
  - a. Biology 206L or 208L; 311C, 311D; and 325, or 315H and 325H.
  - b. One of the following: Biology 320 or 344.
  - c. ~~[One of the following:]~~ Biology 370 ~~[or 373].~~
  - d. Complete one course from each of the following:
    - i. Cellular, developmental, and molecular biology: Biochemistry 369 or 339F, 339M, 339J, 364F; Biology 320, 326R, 330, 335, 336, 339, 339M, 343M, 344, 347 or 360K, 349, 350M, 360M, 361.
    - ii. Genetics, genomics, and computational biology: Biochemistry 339N; Biology 321G, 325T, 327E, 327G, 354C, 366, 366R, 471; Statistics and Data Sciences 348.
    - iii. Physiology, neuroscience, and behavior: Biology 328, 438L, 359K, 359R, 361T, 365N or Neuroscience 365N, 365S, 374; Marine Science 355.
    - iv. Ecology, evolution, and biodiversity: Biology 322, 324, 346, 351, 357, 364, 373, 375;

Marine Science 320, 352C, 352D, 352E, 353, 354, 354C, 354E, 354Q, 356, 357.

- e. Complete one laboratory course from the following list: Biology 320L, 122L, 323L, 124L, 226L, 128L, 129L, 325L, 230L, 331L, 328D, 340L, 446L, 448L, 349L, 353F, 453L, 354L, 455L, 456L, 160L, 361L, 463L, 165U, 369F, 369L, 371L, 472L, 373L, 174L, 478L.
- [i. Nine additional semester hours, including three hours each from three of the four following areas. Courses used to satisfy requirement b or e may not also be used to satisfy requirement d. Of the nine semester hours chosen, at least one approved laboratory course must be completed. These courses are marked with an asterisk. Biology 377 may count with approval of the undergraduate adviser.
- [ii. Animal Biology: Biology 321L\*, 438L\*, 340L\*, 347, 349, 448L\*, 353F\*, 453L\*, 354L\*, 455L\*, 359J, 359K, 359R, 361T, 365S, 369F\*, 369L\*, 371L\*, 478L\*, Marine Science 354 and 354C, and Neuroscience 365R, 366L\*, 366S.
- [iii. Ecology and Evolution: Biology 357, 456L\*, 370, 373, 375, and Marine Science 320, 120L\*, 352C.
- [iv. Molecular Genetics and Microbiology: Biology 320, 325L\*, 326M, 326R, 226L\*, 327D, 344, 366R, Biochemistry 369, and Marine Science 354E.
- [v. Plant Biology: Biology 322 and 122L\*, 324 and 124L\*, 327 and 127L\*, 328, 328D\*, 350M, 351, 352, 374 and 174L\*, and Marine Science 352D.]
3. Secondary science:
- a. Chemistry 301 or 301H, 302 or 302H, and 204.
- b. Complete one of the following: [Six additional semester hours of majors-level coursework chosen from astronomy, biology, chemistry, computer science, environmental science, geological sciences, mathematics, marine science, neuroscience, nutrition, public health, physics, statistics and data sciences, and systems biology.]
- i. Physics 317K and 117M (recommended)
- ii. Physics 303K and 103M
- iii. Physics 301 and 101L

## Chemistry

[no changes]

## Computer Science

### Major

1. Mathematics:
- a. Mathematics 408C or 408N and 408S.
- b. Mathematics 340L or Statistics and Data Sciences 329C. Mathematics 341 may substitute for this requirement.
- c. Statistics and Data Sciences 321. Mathematics 362K may substitute for this requirement.
2. Primary science:
- a. Theory: Computer Science 311 or 311H, and 331 or 331H.
- b. Programming: Computer Science 312 ~~[or 312H]~~ and 314 or 314H.
- c. Systems: Computer Science 429 or 429H, and 439 or 439H.
- d. Twelve additional semester hours of approved upper-division computer science.
3. Secondary science:
- a. Six semester hours of majors-level coursework chosen from a single field of study: ~~[astronomy,]~~ biology, chemistry, ~~[geological sciences, marine science,]~~ or physics. It is recommended that students select courses that will also fulfill the Natural Science and Technology Part I core curriculum requirement.

An undergraduate may not enroll in any computer science course more than once without written consent of an undergraduate adviser in computer science. No student may enroll in any computer science course more than twice. No student may take more than three upper-division computer science courses in a semester without written consent of an undergraduate adviser in computer science.

**Human Development and Family Sciences**

**Human Ecology**

**Mathematics**

[no changes]

**Neuroscience**

**Major**

1. Mathematics:
  - a. Mathematics 408C or 408N and 408S.
  - b. Statistics and Data Sciences 328M.
2. Primary science:
  - a. Biology 206L; 311C, ~~[and]~~ 311D, and 325 or 315H and 325H.
  - b. Neuroscience ~~[365R or]~~ 330.
  - c. Neuroscience 335.
  - d. Twelve additional semester hours of neuroscience, chosen from: ~~[Biology 337 (Topic: Evolutionary Neuroscience), 337 (Topic: Sensory Neuroscience), 337 (Topic: Genetic Analysis of Behavior and Disease),]~~ Biology 359K, 365N, Neuroscience 337, 365D, 365L, 365T, 365W, 366C, 366D, 366E, 366L, 366N, 366P, 366S, 367F, 367V, 367W, [and] 466G, and 466M. Biology 377 may count with prior approval of the faculty advisor.
3. Secondary science:
  - a. Chemistry 301 or 301H, 302 or 302H, and 204.
  - b. One of the following physics sequences:
    - i. Physics ~~[301, 101L, 316, 116L,]~~ 317K, 117M, 317L, 117N.
    - ii. Physics 303K, 103M, 303L, 103N.
    - iii. Physics ~~[317K, 117M, 317L, 117N,]~~ 301, 101L, 316, 116L.

**Nutrition**

**Physics**

[no changes]