Interim Dean David A. Laude of the College of Natural Sciences has filed with the secretary of the Faculty Council the following changes to the College of Natural Sciences Chapter of the Undergraduate Catalog, 2012-2014. The faculty of the college and the dean approved the changes on May 19 and September 26, 2011, respectively. 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 is recommending approval of the changes on a no-protest basis and forwarding the proposed changes to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. Final approval 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 April 23, 2012.

Sue Alexander Greninger, Secretary
General Faculty and Faculty Council

PROPOSED CHANGES TO THE BACHELOR OF SCIENCE, BIOLOGY DEGREE PROGRAM
IN THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE UNDERGRADUATE
CATALOG, 2012-2014

Type of Change  X  Academic Change

1. NAME OF DEGREE PROGRAM: B.S. BIOLOGY

2. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE
MUST CONSULT NEAL ARMSTRONG WHO WILL DETERMINE WHETHER SACS-COC
APPROVAL IS NEEDED.
   • Is this a new degree program? Yes or no? No
   • Does the program offer courses that will be taught off campus? Yes or no? No
   • Will courses in this program be delivered electronically? Yes or no? No

3. EXPLAIN CHANGE TO DEGREE PROGRAM:
   1. Increase the required number of upper-division hours in residence from 18 to 21.
   2. Options I, II, III, V, and VI: change BIO 318M to upper-division: BIO 328M.
   3. All options: where appropriate change CH 210C to 220C, 310M to 320M, and 310N to 320N.
      Option IX: change CH 318M, 318N, 118K, and 118L to upper-division: CH 328M, 328N, 128K, and 128L.
   5. Options I and X: changes to introductory computer science courses due to changes made to the
      computer science course inventory.
   6. Option II #9: remove ANT 348.
   7. Option II #11a: add BIO 325T.
   8. Option II #11a: change BIO 126L to 226L.
   9. Option II #11c: remove BIO 345E and 371M.
   10. Option II #11d: remove ANT 348.
   11. Option II #11e: remove ANT 348.
   12. Option II #12a: add BIO 325T and BIO 337, Epigenetics.
   13. Option II #12b: add BIO 335; BIO 337, Genomics; BIO 337, Emerging Infectious Disease; and
       BIO 337; Epigenetics.
   15. Option II #12b: remove BIO 326M as option and add 339, 370, 320/332/344 requirement.
   16. Option II #12c: add BIO 332; BIO 337, Emerging Infectious Disease; and BIO 339.
   17. Option II #12d: add Chemistry 369, and Sociology 336D, 358D, and 369K.
   18. Option II #12d: remove BME 301 and WGS 345.
   19. Option II #12e: add GRG 356T, Global Societies, and SOC 340C.
   20. Option II #12f: remove ARC 350R.
   22. Option IV: change degree name to Microbiology and Infectious Diseases.
   23. Option IV #7: change organic chemistry/biochemistry statement.
   24. Option IV #8: remove word “either.”
   25. Option IV: add new requirement #9 BIO 206L.
   26. Option IV #10: change wording and delete BIO 129L.
   27. Option IV #11a: add BIO 328M.
   29. Option IV #11b: remove.
       made to UTeach requirements in the 2010-12 catalog front chapter material but not changed in
       degree requirements.
   32. Option VIII: add language to ensure at least a C- in supporting course for teacher certification.
   33. Option IX: remove NSC 301C and replace with UGS 302 or 303.
34. Option X: add Statistics and Scientific Computation 321 or 325H or 328M, or Biology 328M.

3a. **Indicate pages in the undergraduate catalog where changes will be made.** Pages 534-538

4. **GIVE A DETAILED RATIONALE FOR CHANGE. INDIVIDUAL CHANGES SHOULD BE LISTED SEPARATELY.**
   1. Increase the required number of upper-division hours in residence from 18 to 21.
   2. Biostatistics is taught as an advanced computer lab course and should count as an upper-division course. More than 90% of the students who take the course are juniors or seniors.
   4. The intro bio lab has been taught as two different labs each fall and spring semester. The content of the lab is now over 70% similar and will be taught as BIO 206L. BIO 206L is being expanded to accommodate the same student population. The FRI portion will be renamed as BIO 206L-FRI. BIO 205L will now be retired.
   5. The Department of Computer Science made significant changes to their introductory courses, therefore making it necessary for other departments to update the computer science requirements in their degrees.
   6. Non-science courses in the major and courses in the concentrations are hard to get, requiring multiple petitions to count alternatives. Adding courses that are readily available and deleting courses that are no longer offered will increase accuracy and decrease confusion.
   7. Justification is the same as in #5 above.
   8. Lecture portion will be added to lab and content of lab has changed.
   8-20. Justification is the same as in #5 and #6 above.
   21. Changing name to Microbiology and Infectious Diseases would attract more students to the option.
   22. Providing more appropriate choices for organic/biochemistry sequence.
   23-29. Adding courses that are readily available and deleting courses that are no longer offered or readily available will increase accuracy and decrease confusion.
   30. EDC 365C, 365D, and 365E have "same as" relationships with UTS 350, 355, and 360. It is confusing if students are instructed in some semesters to enroll under the EDC course number. Alignment with UTeach material in front chapter that listed the EDC courses in the 2010-12 catalog.
   31. Currently HIS 329U or PHL 329U with a grade of D- will count towards this teaching degree. UTeach requires students to earn at least a C- in all coursework counting toward certification. This would support that standard.
   32. NSC 301C is no longer offered as the Dean’s Scholars seminar course. The Dean’s Scholars seminar course is now being replaced by a section of UGS 303 approved by the departmental honors adviser.
   33. Expand course options for students fulfilling statistics requirement.

5. **SCOPE OF PROPOSED CHANGE**

5a. **Does this proposal impact other colleges/schools? If yes, then how?**
   Yes
   5/6. Deleting courses that are restricted or have limited seats will positively benefit those departments that currently field requests for seats from biology students. The courses being added have been taken by biology students for several semesters.
   7. Pharmacy. It would impact the students who take the lab course at UT by increasing by one hour the total in the degree. Pharmacy has been informed and also requested this change.
   33. Course will be housed in Undergraduate Studies.

If yes, impacted schools must be contacted and their response(s) included:

7. Person communicated with: Richard Wilcox
   Date of communication: 9/19/11
   Response: Approved

33. Person communicated with: Larry Abraham
   Date of communication: 5/31/11
   Response: Approved
5b. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? If yes, explain: No
5c. Will this proposal change the number of hours required for degree completion? No

6. COLLEGE/SCHOOL APPROVAL PROCESS
Department approval date: April 21, 2011, May 10, 2011, and May 16, 2011
College approval date: May 19, 2011
Dean approval date: September 26, 2011

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PRESCRIBED WORK COMMON TO ALL OPTIONS
1. Two courses with a writing flag or a substantial writing component. One of these courses must be upper-division. Courses with a writing flag or a substantial writing component are identified in the Course Schedule. They may be used simultaneously to fulfill other requirements, unless otherwise specified.
2. Options I–VII and X: One of the following foreign language/culture choices. Students in options VIII and IX are exempt from this requirement.5
   a. Second-semester-level proficiency, or the equivalent, in a foreign language.
   b. First-semester-level proficiency, or the equivalent, in a foreign language and a three-semester-hour course in the culture of the same language area.
   c. Two three-semester-hour courses in one foreign culture area. The courses must be chosen from an approved list available in the dean’s office and the college advising centers.
3. At least twenty-four semester hours of upper-division coursework beyond Biology 325 in biology and approved related fields, including at least one course from each of the following areas. In most options, the student must use specific courses to meet this requirement; these courses are listed in “Additional Prescribed Work for Each Option.”
   b. Physiology and neurobiology: Biology 328, 361T, 365R, 365S.
4. At least eighteen semester hours of upper-division coursework in biology must be completed in residence at the University. All students must complete at least thirty-six semester hours of upper-division coursework.

ADDITIONAL PRESCRIBED WORK FOR EACH OPTION
OPTION 1: ECOLOGY, EVOLUTION, AND BEHAVIOR
5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.
7. Chemistry 301 or 301H, 302 or 302H, and 204.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology. Three of these courses must be upper-division. One of the four courses must have a field component; the following courses may be used to meet this requirement: Biology 321L, 340L, 453L, 354L, 455L, 456L, 369L, 373L, Marine Science 352D, 354, 354C.
10. Biology 318M 328M and three hours of coursework chosen from the following: Chemistry 320M, computer science courses at the level of Computer Science 303E or 313E or 307, Geological Sciences 401 or 303, and upper-division mathematics courses.
11. In fulfilling requirement 3 above, the student must complete the following courses. No single course may be used to meet more than one of these requirements.
   b. Evolution: Biology 370.
   c. Behavior and comparative physiology: Biology 322 and 122L, 359K, or 361T.
OPTION II: HUMAN BIOLOGY

5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.
7. Chemistry 301 or 301H, 302 or 302H, and 204.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology and related fields. Three of these courses must be upper-division. The student must complete Biology 205L, 206L, or 208L. Anthropology 432L, 348, Kinesiology 324K, and Marine Science 120L may be counted toward this requirement, but the student must complete at least one upper-division laboratory course in biology.
11. In fulfilling requirement 3 above, the student must complete Biology 346, at least six semester hours in area a below, and at least three hours each in areas b through e.
   b. Anatomy: Anthropology 432L, Biology 446L, 478L, Kinesiology 324K.
   e. Evolution and ecology: Anthropology 348, Biology 357, 364, 370, 373. Biology 373 may not be counted both toward requirement 11e and toward requirement 12f.
12. In fulfilling requirement 3 above, the student must complete at least fifteen semester hours of coursework, including at least nine hours of upper-division work, in one of the following concentrations. A course counted toward requirement 11 may not also be counted toward requirement 12.
Development, and Food Production, 366K, 367K, Marine Science 320, 120L, 354Q, Philosophy 325C, Sociology 319. **Biology 373 may not be counted both toward requirement 11e and toward requirement 12f.**

13. Biology 137 (Topic 1: Senior Seminar in Human Biology), completed on the pass/fail basis in the student’s senior year.

14. Enough additional coursework to make a total of 126 semester hours.

**OPTION III: MARINE AND FRESHWATER BIOLOGY**

5. Mathematics 408C and 408D, or 408N and 408S.

6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.

7. Chemistry 301 or 301H, 302 or 302H, 204, 210C-220C, 310M 320M, and 310N 320N.

8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.

9. At least four laboratory courses in biology. Three of these courses must be upper-division. The student must complete Biology 205L, 206L, or 208L.

10. Biology 318M 328M.

11. Geological Sciences 307 or Marine Science 307; Biology 101C (Topic: Marine Science Seminar); and three semester hours in geological sciences, chosen from courses that may be counted toward the requirements for a major in geological sciences.

12. In fulfilling requirement 3 above, the student must complete the following courses.

a. Biology 426L, 226L, and 326R.

b. Marine Science 320 and 120L.


13. Enough additional coursework to make a total of 126 semester hours.

**OPTION IV: MICROBIOLOGY AND INFECTIOUS DISEASES**

5. Mathematics 408C and 408D, or 408N and 408S.

6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.

7. Chemistry 301 or 301H, 302 or 302H, 204 and an organic chemistry/biochemistry series chosen from the following: Chemistry 220C, 310M 320M, 310N 320N, and 369; or 320M, 320N, 339K, and 339L, and either 369 or both 339K and 339L.

8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.

9. BIO 206L.

10. Two upper-division biology laboratory courses, one of which must be **Five semester hours of upper-division laboratory coursework**, chosen from Biology 129L, 230L, 160L, and 361L. Biology 377/379H may be used for the second course if approved in advance by the microbiology faculty adviser. Biology 226L may not be counted toward requirement #10.

11. In fulfilling requirement 3 above, the student must complete the following courses.

a. Biology 426L, 226L, 326R or 326M, 328M, 330, 339, 360K, and 366, 370, and 320 or 332 or 344.

b. Six semester hours chosen from the following, with at least one hour in a laboratory course: Biology 329, 129L, 230L, 332, 335, 336, 339, 339H, 361L, 361L, 361P, 364. A course counted toward requirement 9 may not also be counted toward requirement 10b.

12. Enough additional coursework to make a total of 126 semester hours.

**OPTION V: CELL AND MOLECULAR BIOLOGY**

5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N.
7. Chemistry 301 or 301H, 302 or 302H, 204, 210C, 220C, 310M, 320M, 310N, 320N, and either 339K and 339L or 369 and 353M.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology. Three of these courses must be upper-division.
10. In fulfilling requirement 3 above, the student must complete the following courses.
   a. Biology 320 and 344.
   b. Biology 420L, 226L, 326R, 349, 370, and one of the following: 320L, 331L, 349L.
   c. Biology 328, 365R, or 365S.
11. Enough additional coursework to make a total of 126 semester hours.

OPTION VI: NEUROBIOLOGY
5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.
7. Chemistry 301 or 301H, 302 or 302H, 204, 210C, 220C, 310M, 320M, and 310N, 320N.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology. The student must complete Biology 205L or 206L, and at least nine semester hours chosen from the following courses: Biology 320L, 325L, 331L, 365L, 366L, 366P, 366S, 371L, 478L, Electrical Engineering 374L.
10. In fulfilling requirement 3 above, the student must complete the following courses.
   a. Biology 320, 344, 349, 370, and either 365R or 371M.
   d. Three additional semester hours chosen from the following courses: Computer Science 303E, Psychology 308, 332, 353K.
11. Enough additional coursework to make a total of 126 semester hours.

OPTION VII: PLANT BIOLOGY
5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.
7. Chemistry 301 or 301H, 302 or 302H, 204, 210C, 220C, 310M, 320M, and 310N, 320N.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology. Three of these courses must be upper-division. The student must complete Biology 205L, 206L, or 208L. Biology 177, 277, or 377 may be counted only once toward the laboratory requirement.
10. In fulfilling requirement 3 above, the student must complete at least twenty-four hours of coursework chosen from the following: Biology 320, 320L, 322 and 122L, 323L, 324 and 124L, 327 and 127L, 328, 128L, 331L, 343M, 350M, 351, 262 and 262L, 363, 370, 472L, 373, 373L, 374 and 174L, 375.
11. Eleven additional semester hours of upper-division coursework in the College of Natural Sciences or the Jackson School of Geosciences. A course may not be counted toward this requirement if it does not fulfill major requirements in the department that offers it.
12. Enough additional coursework to make a total of 126 semester hours.
OPTION VIII: TEACHING

This option is designed to fulfill the course requirements for certification as a middle grades or secondary school science teacher in Texas; the student chooses either composite science certification with biology as the primary teaching field or life science certification. However, completion of the course requirements does not guarantee the student’s certification. Information about additional certification requirements is available from the UTeach-Natural Sciences academic adviser.

5. Mathematics 408C and 408D, or 408N and 408S.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N; 302K, 102M, 302L, and 102N.
7. Chemistry 301 or 301H, 302 or 302H, 204, and either Chemistry 310M 320M, 310N 320N, and 240C 220C or 310M 320M and 369.
8. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.
9. At least four laboratory courses in biology. Three of these courses must be upper-division. The student must complete Biology 205L, 206L, or 208L.
10. In fulfilling requirement 3 above, the student must complete the following courses.
   a. Biology 320, 126L, 226L, 326R, 370, and either 324 and 124L or 322 and 122L.
   c. One of the following courses with a substantial field component: Biology 321L, 340L, 342L, 453L, Marine Science 352D, 354, 354C.
11. One of the following research methods courses: Biology 328D, 337 (Topic 2: Research Methods: UTeach), Chemistry 368 (Topic: Research Methods—UTeach), Physics 341 (Topic: Research Methods—UTeach).
12. History 329U or Philosophy 329U.
13. One of the following:
   a. For composite science certification: Six semester hours of coursework in geological sciences. Courses intended for nonscience majors may not be counted toward this requirement. The remaining composite certification content requirements are met by the chemistry and physics courses used to fulfill requirements 6 and 7.
   b. For life science certification: Biology 373 and three additional semester hours of biology chosen from the courses listed in requirement 10b.
   a. Curriculum and Instruction 650S.
   b. Curriculum and Instruction 365C or UTeach-Natural Sciences 350.
   c. Curriculum and Instruction 365D or UTeach-Natural Sciences 355.
   d. Curriculum and Instruction 365E or UTeach-Natural Sciences 360.
   e. UTeach-Natural Sciences 101, 110, and 170.
15. Students seeking middle grades certification must complete the following courses: Educational Psychology 363M (Topic 3: Adolescent Development), or Psychology 301 and 304; and Curriculum and Instruction 339E.
16. Enough additional coursework to make a total of 126 semester hours.

OPTION IX: BIOLOGY HONORS

5. Breadth requirement: An honors mathematics course; Biology 315H and 325H; Chemistry 301H and 302H; and one of the following: a three-hour honors-designated computer science course; a three-hour honors-designated statistics course; Physics 301 and 101L; Physics 315 and 115L; or Physics 316 and 116L. Credit earned by examination may not be counted toward this requirement.
6. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N. Courses used to satisfy this requirement may also be counted toward requirement 5.
7. Chemistry 204, 128K, 128K, 128L, 318M 328M, and 318N 328N.
8. In fulfilling requirement 3 above, the student must complete Biology 320 or 344, 349, 365R, 370, and at least twelve additional semester hours of upper-division coursework in biology chosen from a list available in the student’s advising office. Six semester hours of thesis coursework may be counted toward the twelve semester hours of upper-division biology.

9. Three upper-division laboratory courses in biology. Biology 377 or 379H may be used as only one of the three required upper-division laboratory courses. Courses used to fulfill this requirement may also be counted toward requirement 8.

10. Natural Sciences 301C. A section of Undergraduate Studies 302 or 303 that is approved by the departmental honors adviser.

11. A section of Rhetoric and Writing 309S that is restricted to Dean’s Scholars.

12. Two semesters of Biology 379H.

13. Fifteen additional semester hours of coursework approved by the departmental honors adviser.

14. Six semester hours of coursework in the College of Liberal Arts or the College of Fine Arts.

15. Enough additional coursework to make a total of 120 semester hours.

OPTION X: COMPUTATIONAL BIOLOGY

5. Mathematics 408C and 408D, or 408N, 408S, and 408M; Statistics and Scientific Computation 329C, 340L or 341; Mathematics 362K; and Mathematics 358K or 378K or Statistics and Scientific Computation 321 or 325H or 328M, or Biology 328M.


7. An eight-semester-hour sequence of coursework in physics chosen from the following: Physics 301, 101L, 316, and 116L; 317K, 117M, 317L, and 117N; 303K, 103M, 303L, and 103N.

8. Chemistry 301 or 301H, 302 or 302H, and 204.

9. Either Biology 311C, 311D, and 325 or Biology 315H and 325H. These courses must be completed before the student progresses to other upper-division biology courses.

10. In fulfilling requirement 3 above, the student must complete Biology 321G, 370, and six additional hours of upper-division coursework in biology.

11. At least four laboratory courses in biology. Three of these courses must be upper-division. Biology 321G fulfills one of these upper-division requirements.

12. Enough additional coursework to make a total of 126 semester hours.

SPECIAL REQUIREMENTS

Students in all options must fulfill the University-wide graduation requirements given in chapter 1 and the college requirements given earlier in this chapter. They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in General Information.

To graduate and be recommended for certification, students who follow the teaching option must have a University grade point average of at least 2.50. They must earn a grade of at least C- in the supporting course in requirement 12, and in each of the professional development courses listed in requirement 14 and must pass the final teaching portfolio review; those seeking middle grades certification must also earn a grade of at least C- in each of the courses listed in requirement 15. For information about the portfolio review and additional teacher certification requirements, students should consult the UTeach-Natural Sciences academic adviser.

To graduate under the honors option, students must remain in good standing in the Dean’s Scholars Honors Program, must submit an honors thesis approved by the departmental honors adviser, and must present their research in an approved public forum, such as the college’s annual Undergraduate Research Forum.