PROPOSED CHANGES TO DEGREE PROGRAMS IN THE
UNDERGRADUATE CATALOG 2014-2016

Type of Change

___ Nonacademic Change

X Academic Change

___ Degree Program Change

1. NAME OF DEGREE PROGRAM: B.S. Computer Science

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. Option I, II, IV, and V: add in M 362K as an alternative to SSC 321.
   2. Options I, II, and IV: remove BIO 325 from the biology science sequence option. Add 3 hours of upper-division Biology to the advanced biology science sequence.
   3. Options I and II: remove CS 313K or 313H, 336 or 336H, 337 or 337H, 341 or 341H or 357 or 357H. Add CS 311 or 311H, 331 or 331H.
   4. Option III: remove CS 313H and 336H; add CS 311H and 331H.
   5. Options I, II, IV, and V: remove CS 345 or 345H.
   6. Options I, II, and V: Add 3 additional hours each from 3 lists of approved coursework, in theory, programming, and systems.
   7. Option II: Add 12 additional hours of upper-division in Computer Science. Specify the requirements that must be approved by director and requirements that count toward minimum # of honors courses.
   8. Special Requirements: Remove CS 313K and add CS 311 or 311H.

3a. Indicate pages in the undergraduate catalog where changes will be made.

4. GIVE A DETAILED RATIONALE FOR CHANGE. INDIVIDUAL CHANGES SHOULD BE LISTED SEPARATELY.

   1. With changes in the focus and practice of computer science, probability has become essential to the field. It is the basis for major new developments, including, for example, machine learning and data mining, the processing of big datasets, and the use of probabilistic algorithms.
   2. The CS faculty intend for the introductory science sequences to mirror the first year science sequences for students in these fields of study. The faculty intend for the advanced science sequences to reflect the knowledge base achieved by taking 2 advanced courses in a field of study.
   3. The CS faculty are reducing the number of courses that students are required to take in order to create more opportunities to select electives. Toward this end, the faculty would like to replace CS 313K (or CS 313H), CS 336 (or CS 336H), CS 337 (or CS 337H), and the requirement to take either CS 341 (or CS 341H) or...
CS 357 (or CS 357H), with two courses -- CS 311 (or CS 311H) and CS 331 (or CS 331H) – which have been designed to teach the fundamental concepts of computer theory.

4. The Computer Science faculty would like to drop CS 313H and 336H. The faculty would like to add CS 311H and 331H. These courses have significant changes in content from CS 313H and 336H in response to developments in theoretical computer science.

5. The Undergraduate Studies Committee, with full support of the Computer Science faculty, would like to remove CS 345/345H (Programming Languages) as a requirement from all BS degree options because we do not consider the class to be essential for all students. This is part of our larger effort to reduce the "core" to only essential topics. However, we plan to continue offering the class as an upper-division elective.

6. The CS faculty are reducing the number of courses that students are required to take in order to create more opportunities to select electives. Still, the faculty want to insure that CS graduates have a solid foundation in the core areas of programming, systems and theory. By requiring students to take one additional course in these areas, beyond the set of required, core courses, students will obtain the necessary background while still having some flexibility to choose.

7. Option II: 12 additional hours of upper-division in Computer Science were inadvertently deleted from 2010-12 catalog when deleting the phrase “34 upper-division hours in Computer Science.” The 34 hours were made up of 22 hours in required courses, leaving the additional 12 upper-division hours as required but not explicitly stated.

8. The Computer Science faculty would like to drop CS 313K (and CS 313H) and not teach it again. The course has been changed to CS 311 (and CS 311H) with a significant change in course content in response to developments in theoretical computer science.

5. **SCOPE OF PROPOSED CHANGE**

5a. Does this proposal impact other colleges/schools? If yes, then how? No.

   If yes, impacted schools must be contacted and their response(s) included:
   Person communicated with:
   Date of communication:
   Response:

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.

   If yes, undergraduate studies must be informed of the proposed changes and their response included:
   Person communicated with:
   Date of communication:
   Response:

5c. Will this proposal change the number of hours required for degree completion? If yes, explain: No.

6. **COLLEGE/SCHOOL APPROVAL PROCESS**

   Department approval date: May 2, 2012
   College approval date: 
   Dean approval date:
Include proposed catalog copy below. The proposed text should be based on the text of the current catalog available at [http://www.utexas.edu/faculty/council/pages/catalog_chgs/catcopy.html](http://www.utexas.edu/faculty/council/pages/catalog_chgs/catcopy.html). Strike through and replace only the specific language to be changed. For questions on completing this section, please contact Anita Ahmadi, fc@austin.utexas.edu, 471-5936 or Brenda Schumann, brenda.schumann@austin.utexas.edu, 475-7654.

2014–2016 CATALOG

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

PRESCRIBED WORK COMMON
TO ALL OPTIONS

All students pursuing an undergraduate degree must complete the University's core curriculum, described in chapter 2. The core includes courses in language, literature, social sciences, natural sciences, and fine arts.

In addition, students seeking the BSCS must complete the following degree-level requirements. In some cases, courses that fulfill degree-level requirements also meet the requirements of the core.

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, II, and IV: One of the following foreign language/culture choices. Students in options III and V are exempt from this requirement.

   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 forty-two semester hours of upper-division coursework.

4. At least twenty-one semester hours of upper-division coursework in computer science must be completed in residence at the University.

ADDITIONAL PRESCRIBED WORK
FOR EACH OPTION

OPTION I: COMPUTER SCIENCE

5. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Scientific Computation 329C; and Mathematics 362K or Statistics and Scientific Computation 321.

6. One of the following sequences of coursework:

   a. Either Biology 311C, 311D, and 325 or Biology 315H and 325H, and Biology 206L, or 208L.
   b. Chemistry 301 or 301H, 302 or 302H, and 204.
   c. Geological Sciences 401 and either 404C or 405.
   d. Physics 303K, 303L, 103M, and 103N.

7. An additional sequence chosen from those in requirement 6 above, or one of the following:

   a. At least six three hours of upper-division coursework in biology approved by the undergraduate adviser.
   b. Chemistry 128K, 128L, 328M, and 328N, or Chemistry 220C, 320M, and 320N, or at least six hours of upper-division coursework in chemistry approved by the undergraduate adviser.
   c. Geological Sciences 416K and 426P, or at least six hours of upper-division coursework in geological sciences approved by the undergraduate adviser.
   d. Physics 315 and at least three hours of upper-division coursework in physics approved by the
undergraduate adviser.
e. At least six hours of upper-division coursework in mathematics approved by the undergraduate adviser. A course may not be counted toward both requirement 5 and requirement 7.
f. Electrical Engineering 313 and 331.
8. Computer Science 312 or 312H, 313K or 313H, 314 or 314H, 429 or 429H, 336 or 336H, 439 or 439H, 341 or 341H or 357 or 357H, 345 or 345H, and fifteen additional hours of approved upper-division coursework.
8. The following courses in Computer Science:
a. Theory: Computer Science 311 or 311H, 331 or 331H, and three additional hours from an approved list available in the department.
b. Programming: Computer Science 312 or 312H, 314 or 314H, and three additional hours from an approved list available in the department.
c. Systems: Computer Science 429 or 429H, 439 or 439H, and three additional hours from an approved list available in the department.
d. Fifteen additional hours of upper-division courses in Computer Science.
9. Enough additional coursework to make a total of 127 semester hours.

OPTION II: TURING SCHOLARS HONORS

5. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Scientific Computation 329C; and Mathematics 362K or Statistics and Scientific Computation 321.
6. One of the following sequences of coursework:
a. Either Biology 311C, 311D, and 325 or Biology 315H and 325H; and Biology 206L, or 208L.
b. Chemistry 301 or 301H, 302 or 302H, and 204.
c. Geological Sciences 401 and either 404C or 405.
d. Physics 303K, 303L, 103M, and 103N.
7. An additional sequence chosen from those in requirement 6 above, or one of the following:
a. At least six hours of upper-division coursework in biology approved by the undergraduate adviser.
b. Chemistry 128K, 128L, 328M, and 328N, or Chemistry 220C, 320M, and 320N, or at least six hours of upper-division coursework in chemistry approved by the undergraduate adviser.
c. Geological Sciences 416K and 426P, or at least six hours of upper-division coursework in geological sciences approved by the undergraduate adviser.
d. Physics 315 and at least three hours of upper-division coursework in physics approved by the undergraduate adviser.
7. At least six hours of upper-division coursework in mathematics approved by the undergraduate adviser. A course may not be counted toward both requirement 5 and requirement 7.
f. Electrical Engineering 313 and 331.
8. Computer Science 313K or 313H, and 314 or 314H.
9. Computer Science 429 or 429H, 336 or 336H, 337 or 337H, 439 or 439H, 341 or 341H or 357 or 357H, 345 or 345H, 178H, and 379H. The courses the student chooses to fulfill this requirement must be approved by the Turing Scholars program director; at least five of them, in addition to Computer Science 178H and 379H, must be honors courses. The honors thesis the student completes in Computer Science 379H must be approved by the program director.
8. The following courses in Computer Science:
a. Theory: Computer Science 311 or 311H, 331 or 331H, and three additional hours from an approved list available in the department.
b. Programming: Computer Science 314 or 314H, and three additional hours from an approved list available in the department.
c. Systems: Computer Science 429 or 429H, 439 or 439H, and three additional hours from an approved list available in the department.
d. Computer Science 178H and 379H.
e. 12 additional hours of upper-division courses in Computer Science. The courses the student chooses to fulfill requirements a through c must be approved by the Turing
Scholars program director. In addition to Computer Science 178H and 379H, at least four upper-division courses chosen to fulfill requirements a through e must be honors courses. The honors thesis the student completes in Computer Science 379H must be approved by the program director.

10. Enough additional coursework to make a total of 127 semester hours.

**OPTION III: COMPUTER SCIENCE HONORS**

5. Breadth requirement: An honors mathematics course; Computer Science 311H, 313H, and 314H; one of the following two-semester sequences: Biology 315H and 325H, Chemistry 301H and 302H, Physics 301, 101L, 316, and 116L; and either an additional three hours chosen from these courses or Physics 315 and 115L. Credit earned by examination may not be counted toward this requirement.

6. At least six semester hours of upper-division coursework in mathematics.


8. A section of Undergraduate Studies 302 or 303 that is approved by the departmental honors adviser.

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

10. Computer Science 379H and a three-semester-hour upper-division research course approved by the departmental honors adviser.

11. Twenty-five additional semester hours of coursework approved by the departmental honors adviser.

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

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

**OPTION IV: INTEGRATED PROGRAM**

5. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Scientific Computation 329C; and **Mathematics 362K** or Statistics and Scientific Computation 321.

6. One of the following sequences of coursework:
   a. Either Biology 311C, 311D, and 325 or Biology 315H and 325H; and Biology 206L or 208L.
   b. Chemistry 301 or 301H, 302 or 302H, and 204.
   c. Geological Sciences 401 and either 404C or 405.
   d. Physics 303K, 303L, 103M, and 103N.

7. An additional sequence chosen from those in requirement 6 above, or one of the following:
   a. At least six three hours of upper-division coursework in biology approved by the undergraduate adviser.
   b. Chemistry 128K, 128L, 328M, and 328N, or Chemistry 220C, 320M, and 320N, or at least six hours of upper-division coursework in chemistry approved by the undergraduate adviser.
   c. Geological Sciences 416K and 426P, or at least six hours of upper-division coursework in geological sciences approved by the undergraduate adviser.
   d. Physics 315 and at least three hours of upper-division coursework in physics approved by the undergraduate adviser.
   e. At least six hours of upper-division coursework in mathematics approved by the undergraduate adviser. A course may not be counted toward both requirement 5 and requirement 7.
   f. Electrical Engineering 313 and 331.

8. Computer Science 312 or 312H, 313K or 313H, 314 or 314H, 429 or 429H, 336 or 336H, 337, 439 or 439H, 345 or 345H, 353 or 357 or 357H, and nine additional hours of approved upper-division coursework.

8. The following courses in Computer Science:
   a. **Theory:** Computer Science 311 or 311H, 331 or 331H, and three additional hours from an approved list available in the department.
   b. **Programming:** Computer Science 312 or 312H, 314 or 314H, and three additional hours from an approved list available in the department.
   c. **Systems:** Computer Science 429 or 429H, 439 or 439H, and three additional hours from an approved list available in the department.
   d. **Computer Science 353 or 357 or 357H.**
   e. Nine additional hours of upper-division courses in Computer Science.

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

OPTION V: TEACHING (SENIOR GRADES)

5. History 329U or Philosophy 339U.
6. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Scientific Computation 329C.
7. One of the following sequences of coursework:
   a. Biology 311C and 311D; and Biology 206L or 208L.
   b. Chemistry 301 or 301H, 302 or 302H, and 204.
   c. Geological Sciences 401 and either 404C or 405.
   d. Physics 303K, 303L, 103M, and 103N.
8. Computer Science 312 or 312H, 313K, 314 or 314H, 429 or 429H, 336 or 336H, 337 or 337H, 439 or 439H, 341 or 341H or 357 or 357H, and 345 or 345H.
8. The following courses in Computer Science:
   a. Theory: Computer Science 311 or 311H, 331 or 331H, and three additional hours from approved list available in the department.
   b. Programming: Computer Science 312 or 312H, 314 or 314H, and three additional hours from an approved list available in the department.
   c. Systems: Computer Science 429 or 429H, 439 or 439H, and three additional hours from an approved list available in the department.
9. The requirements of one of the following certification areas:
   a. For Computer Science Certification:
      iii. An additional sequence chosen from the following:
           1. Biology 325 and 337 (Research Methods-U Teach).
           2. At least three hours of upper-division coursework in chemistry approved by the undergraduate adviser; and Chemistry 368 (Research Methods-U Teach).
      ii. Fifteen additional hours of approved computer science upper-division coursework.
   b. For Computer Science and Mathematics Certification:
      ii. Twelve additional hours of approved computer science upper-division coursework.
      iii. Biology 337 (Topic 2, Research Methods-U Teach), or Chemistry 368 (Topic 1: Research Methods-U Teach), or PHY 341 (Topic 7: Research Methods-U Teach).
10. Eighteen semester hours of professional development coursework consisting of
   a. Curriculum and Instruction 650S.
   b. Curriculum and Instruction 365C or U Teach-Natural Sciences 350.
   c. Curriculum and Instruction 365D or U Teach-Natural Sciences 355.
   d. Curriculum and Instruction 365E or U Teach-Natural Sciences 360.
   e. U Teach-Natural Sciences 101, 110, and 170.
11. Enough additional coursework to make a total of 127 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 5, and in each of the professional development courses listed in requirement 10 and must pass the final teaching portfolio review. For information about the portfolio review and additional teacher certification requirements, students should consult the UTeach-Natural Sciences academic adviser.

With the exception of Computer Science 312 or 312H, 311 or 311H, 313K, and 314 or 314H, all computer science courses that may be counted toward a degree in computer science are restricted to students who have been admitted to the computer science major or have the consent of the undergraduate faculty adviser.

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.