PROPOSED CHANGES TO THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE DEGREE PROGRAM IN THE COLLEGE OF NATURAL SCIENCES SECTION IN THE UNDERGRADUATE CATALOG 2016-2018

Type of Change
- ☒ Academic Change
- ☐ Degree Program Change (THECB\textsuperscript{2} 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:
   1. Streamline the first science sequence requirements in Options I, II, and IV by removing the biology and chemistry labs and deleting the two-course geological sciences sequence. Create more flexibility for students who want to study physics by allowing any calculus-based physics sequence, including mixed sequences, to count without need of petitions.
      **Rationale:** Experience with lab work in biology and chemistry is not necessary for computer scientists working in biology and chemistry as computational specialists. The physics laboratory courses are co-requisites for the physics lecture courses; hence these labs cannot be removed. Computer science students often take the engineering physics sequence but any calculus-based physics sequence is suitable. Writing the requirement as the first half of the three sequences and the second half of the three sequences allows students who switch sequences midstream without the need to file petitions. These changes are a formalization of a long-standing departmental policy of counting other calculus-based physics sequences, including mixed sequences.
      The Jackson School of Geosciences restricts enrollment in its major-level coursework to majors, making it extremely difficulty for students to complete this sequence. The only geological science courses readily available are designed for non-science majors, and are not suitable for computer science majors.

   2. Reduce the second science sequence requirement in Options I, II, and IV from a full-year sequence to a one semester experience. Add a three hour, upper-division course in mathematics as an alternative.
      **Rationale:** The computer science faculty determined that exposure to science outside of computer science is beneficial but that another year of science is unnecessary. In addition, the science courses are not prerequisites for other requirements on the BS in Computer Science. Computer science is closely related to mathematics and is a good choice for students who wish to explore the theoretical foundations of computer science.

   3. Increase by 1 the number of upper-division computer science honors courses required; exclude CS 429H from applying toward this requirement, in Option II.
      **Rationale:** Prior to the computer science curriculum overhaul in the 2014-16 catalog, Option II majors were required to complete 5 upper-division computer science honors courses when choosing courses to fulfill requirements 9a through 9e. The number was reduced to 4 in the 2014-16 catalog, in error. Regarding the exclusion of CS 429H, the course is primarily made up of content previously offered as CS 310H and EE 316. An introductory course in systems was not applicable toward the 5 required honors courses.
Taken together, these changes re-establish the honors requirement as intended by the Department of Computer Science.

4. Remove CS 353, Theory of Computation, in Option IV, 9d; consequently, delete 9e and move its requirements up to 9d.
   **Rationale:** CS 353 was listed as a required course in error in the 2014-16 catalog. Its removal corrects this error.

5. Reduce the total hours to 120 in Options I and II.
   **Rationale:** Reducing science requirements outside of computer science creates the opportunity to reduce the overall hours of the degree to 120 hours. The faculty would prefer that students graduate earlier or have more free time in their schedules to explore extracurricular activities that may assist them in personal and professional growth. Options III and IV are already at 120 hours. Option V, Teaching, cannot be reduced due to extensive certification requirements of the state of Texas.

6. Remove CS 312H from list of classes that may be taken by students who are not yet admitted to the Computer Science major. Clarify that enrollment in CS 312, 311 or 311H, and 314 or 314H is restricted to students admitted to the CS entry-level major.
   **Rationale:** CS 312 is removed because the course has never been developed and consequently will never be offered. The statement that CS 312, 311 or 311H, and 314 or 314H are open only to CS entry-level majors is added to reflect ongoing enrollment restrictions.

3. **THIS PROPOSAL INVOLVES** (Please check all that apply)
   - [x] Courses in other colleges
   - [ ] Courses in proposer’s college that are frequently taken by students in other colleges
   - [ ] Flags
   - [ ] Course in the core curriculum
   - [ ] Change in course sequencing for an existing program
   - [ ] Courses that have to be added to the inventory
   - [ ] Change in admission requirements (external or internal)
   - [ ] Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office)

4. **SCOPE OF PROPOSED CHANGE**
   a. Does this proposal impact other colleges/schools?  
      Yes [x] No [ ]
      If yes, then how? Removing the geology and electrical engineering sequences will slightly reduce enrollments in the impacted courses for these two departments. See details below.
   b. Do you anticipate a net change in the number of students in your college?  
      Yes [ ] No [x]
      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 [x]
      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 [x] 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? At most, 18 seats in GEO 401 across the academic year; and 18 seats in other lower-division GEO courses across the academic year. No seats lost in
GEO 416K, 426K, and upper-division GEO taken by GEO majors – enrollment in these courses are restricted. Non-majors are unable to enroll.

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, JSG is fine with this change.”

How many students do you expect to be impacted? At most, 18 seats in EE 313 across the academic year; and 18 seats in EE 331 across the academic year.
Impacted schools must be contacted and their response(s) included:
Person communicated with: Dr. Ahmed Tewfik, Department of Electrical and Computer Engineering
Date of communication: April 10, 2015
Response: “Hi Doug, Our curriculum committee is fine with this change. Regards, Ahmed”

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? Yes. Options I and II will be reduced to 120 hours (from 127 hours). If yes, explain:
   Due to the reduction in science coursework apart from computer science and mathematics, students may fulfill the degree requirements within 120 hours, including room for electives.

5. COLLEGE/SCHOOL APPROVAL PROCESS
   Department approval date:
   College approval date:
   Dean approval date:

PROPOSED NEW CATALOG TEXT:

Bachelor of Science in Computer Science

The Bachelor of Science in Computer Science degree program provides a strong technical background for students planning to begin careers upon graduation and for those interested in graduate study in computer science. This program allows students to take more coursework in computer science and related technical areas than does the bachelor of arts degree program.

In addition to the three options leading to the Bachelor of Science in Computer Science, students may apply to option IV, the Integrated Program, which leads to simultaneous completion of the Bachelor of Science in Computer Science and the Master of Science in Computer Science, the Master of Science in Information Studies, or the Master of Science in Computational Science, Engineering, and Mathematics. The requirements for the Bachelor of Science in Computer Science, option IV, are given below. The requirements for the Master of Science in Computer Science, the Master of Science in Information Studies, and the Master of Science in Computational Science, Engineering, and Mathematics are described in the Graduate Catalog.

Students who would like to pursue any of the following options must first be admitted to the degree program. The admission processes for options I, II, and IV are described in The Major in Computer Science; the admission process for option III is described in the section Dean’s Scholars Honors Program.

Prescribed Work Common to All Options
All students pursuing an undergraduate degree must complete the University’s Core Curriculum. In addition, students seeking the Bachelor of Science in Computer Science 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. One of these courses must be upper-division.
2. One course with a quantitative reasoning flag.

Courses with flags are identified in the Course Schedule. They may be used simultaneously to fulfill other requirements, unless otherwise specified.

3. Options I, II, and IV: One of the following foreign language/culture choices. Students in option 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.
4. At least forty-two semester hours of upper-division coursework.
5. 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

6. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Data Sciences 329C; and Mathematics 362K or Statistics and Data Sciences 321.
7. One of the following sequences of coursework:
   a. Either Biology 311C and 311D, or Biology 315H and 325H, and Biology 206L or 208L.
   b. Chemistry 301 or 301H, and 302 or 302H, and 204.
   c. Geological Sciences 401 and either 404C or 405, Physics 303K and 103M, 301 and 101L, or 317K and 117M; and 303L and 103N, 316 and 116L, or 317L and 117N.
   d. Physics 303K, 303L, 103M, and 103N.
8. Three additional hours chosen from a different sequence listed in requirement 7 or three hours of upper-division mathematics, excluding 325K, 340L, 341, and 362K. An additional sequence chosen from those in requirement 7 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.
   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 6 and requirement 8.
   f. Electrical Engineering 313 and 331.
9. 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 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.

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

Option II: Turing Scholars Honors

6. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Data Sciences 329C; and Mathematics 362K or Statistics and Data Sciences 321.
7. One of the following sequences of coursework:
   a. Either Biology 311C and 311D, or Biology 315H and 325H; and Biology 206L or 208L.
   b. Chemistry 301 or 301H, and 302 or 302H, and 204.
   c. Geological Sciences 401 and either 401C or 405; Physics 303K and 103M, 301 and 101L, or 317K and 117M; and 303L and 103N, 316 and 116L, or 317L and 117N.
   d. Physics 303K, 303L, 103M, and 103N.
8. Three additional hours chosen from a different sequence listed in requirement 7 or three hours of upper division mathematics, excluding 325K, 340L, 341, and 362K. An additional sequence chosen from those in requirement 7 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.
   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 6 and requirement 8.
   f. Electrical Engineering 313 and 331.
9. 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. Twelve 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 429H, 178H and 379H, at least four five 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

6. Breadth requirement: An honors mathematics course; Computer Science 311H 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.

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

8. Computer Science 429H, 331H, 439H, and twelve additional hours of upper-division coursework in computer science.

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

10. A section of Rhetoric and Writing 309S that is restricted to students in the Dean's Scholars Honors Program.

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

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

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

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

Option IV: Integrated Program

6. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Data Sciences 329C; and Mathematics 362K or Statistics and Data Sciences 321.

7. One of the following sequences of coursework:
   a. Either Biology 311C and 311D, 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, Physics 303K and 103M, 301 and 101L, or 317K and 117M; and 303L and 103N, 316 and 116L, or 317L and 117N.
   d. Physics 303K, 303L, 103M, and 103N.

8. Three additional hours chosen from a different sequence listed in requirement 7 or three hours of upper-division mathematics, excluding 325K, 340L, 341L and 362K. 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.
   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 6 and requirement 8.
   f. Electrical Engineering 313 and 331.

9. 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 333 or 333H, Nine additional hours of upper-division courses in computer science.
   e. Nine additional hours of upper-division courses in computer science.

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

Option V: Teaching (Senior grades)
6. History 329U or Philosophy 329U.
7. Mathematics 408C and 408D, or 408N, 408S, and 408M; either 340L or 341 or Statistics and Data Sciences 329C.
8. One of the following sequences of coursework:
   a. Biology 311C and 311D, and Biology 206L or 208L.
   b. Chemistry 301 or 301H, and 302 or 302H, and 204.
   c. Geological Sciences 401 and either 404C or 405. Physics 303K and 103M, 301 and 101L, or 317K and 117M; and 303L and 103N, 316 and 116L, or 317L and 117N.
   d. Physics 303K, 303L, 103M, and 103N.
9. 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.
10. The requirements of one of the following certification areas:
   a. For computer science certification:
      i. Mathematics 362K and Statistics and Data Sciences 321.
      ii. An additional sequence chosen from the following:
          2. At least three hours of upper-division coursework in chemistry approved by the undergraduate adviser; and Chemistry 368 (Topic 1: Research Methods: UTeach).
      iii. 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: UTeach), or Chemistry 368 (Topic 1: Research Methods: UTeach), or Physics 341 (Topic 7: Research Methods: UTeach).
11. Eighteen semester hours of professional development coursework consisting of:
   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.
12. Enough additional coursework to make a total of 127 semester hours.

Special Requirements

Students in all options must fulfill both the University's general requirements for graduation and the college requirements. 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 6, and in each of the professional development courses listed in requirement 11 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 Enrollment in Computer Science 312 or 312H, 311 or 311H, and 314 or 314H, is restricted to computer science entry-level majors, all other 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.

Additional Requirements for Option II

Students in option II, the Turing Scholars program, must maintain a University grade point average of at least 3.30 and a grade point average in computer science of at least 3.30; in rare circumstances, this grade point average requirement will be waived for students whose honors thesis has been judged by the Department of Computer Science Undergraduate Thesis Committee to be truly outstanding. In addition to this grade point average requirement, students in option II must know and abide by the academic and disciplinary policies given in this catalog and in the General Information Catalog. Those who fail to do so will be considered for academic dismissal from the Turing Scholars program. Under special circumstances and at the discretion of the director, a student will be allowed to continue in the program under academic review. A student who is academically dismissed from the program may enter another computer science program if he or she fulfills the scholastic standards for continuance in the University given in General Information. Students in scholastic difficulty should discuss their problems with a Turing Scholars program academic adviser and the director.

Additional Requirements for Option III

To graduate under option III, students must remain in good standing in the Dean’s Scholars Honors Program, must earn grades of at least A- in the departmental research and thesis courses described in requirement 10 above, and must present their research in an approved public forum, such as the college’s annual Undergraduate Research Forum. More information about the Undergraduate Research Forum is available at https://cns.utexas.edu/.

Additional Requirements for Option IV

Satisfactory Progress

Students are expected to make continuous progress toward the degree by completing required computer science coursework each semester. Those who fail to take program coursework two long-session semesters in a row will be removed from the program and re-enrolled in the Bachelor of Science in Computer Science option (I, II, or III) that they were following before admission to the Integrated Program (option IV). Students will be notified before this action is taken; they must meet with their academic adviser upon being notified.

Probation

The student is placed on probation if his or her grade point average in required undergraduate computer science courses falls below 3.00. Except with the consent of the undergraduate adviser or the graduate adviser, a student on probation may not take graduate computer science courses.

Dismissal
The student is dismissed from the Integrated Program if (1) he or she fails to improve his or her academic performance significantly while on probation, or (2) he or she will not achieve a grade point average of 3.00 even by earning grades of A in all remaining required undergraduate computer science and graduate courses. Like all students, those in the Integrated Program must know and abide by the academic and disciplinary policies given in this catalog and in the General Information Catalog. Those who fail to do so will be considered for academic dismissal from the program. Under special circumstances and at the discretion of the director, a student may be allowed to continue in the program under academic review. A student who is academically dismissed from the program may enter another computer science program if he or she fulfills the scholastic standards for continuance in the University given in the General Information Catalog. Students in scholastic difficulty should discuss their problems with an academic adviser and the undergraduate faculty adviser.

**Graduation**

To receive the Bachelor of Science in Computer Science and Master of Science in Computer Science, Master of Science in Information Studies, or Master of Science in Computational Science, Engineering, and Mathematics degrees through the Integrated Program, a student must have a University grade point average of at least 3.00 in the coursework in the Master of Science Program of Work. He or she must also have a grade point average in graduate computer science and information studies, or computational science, engineering, and mathematics coursework of at least 3.00.

**Order and Choice of Work**

The student must consult the faculty adviser each semester regarding order and choice of work. Note: Computer science courses with numbers ending in H are intended for students in option II, the Turing Scholars program, and option III, computer science honors. Students outside these options may enroll in these courses only with the special consent of the honors director.

---

1 See [http://www.utexas.edu/provost/planning/cat_change/UnderGrad.html](http://www.utexas.edu/provost/planning/cat_change/UnderGrad.html) for detailed explanations.
2 Texas Higher Education Coordinating Board.
3 Exclusive: of exclusive application and of primary interest only to a single college or school ("no protest" period is 5 working days); general: of general interest to more than one college or school (but not for submission to the General Faculty) ("no protest" period is 10 working days); major legislation must be submitted to the General Faculty for adoption ("no protest" period is 10 working days).
4 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 (with underlines) only the specific language to be changed. Do NOT use “track changes!”** For questions on completing this section, please contact Victoria Cervantes, fc@austin.utexas.edu, 471-5936 or Brenda Schumann, brenda.schumann@austin.utexas.edu, 475-7654.