February 24, 2014

Gregory Fenves
Executive Vice President and Provost
The University of Texas at Austin
MAI 201
Campus Mail Code: G1000

Dear Dr. Fenves:

Enclosed for your consideration and action is a proposal to make changes to the BS in Computer Science Integrated Program (D 11293-11297) in the College of Natural Sciences section of the Undergraduate Catalog 2014-2016. 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 February 21, 2014. The authority to grant final approval on these changes resides with UT System.

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

Sincerely,

[Signature]

Dean P. Neikirk, Secretary
General Faculty and Faculty Council

DPN:dlr

Enclosure

xc: William Powers Jr., President
Charles Roeckle, Deputy to the President

ec (letter only): Linda Hicke, dean, College of Natural Sciences
Alison Danforth, manager, IMA
Brenda Schumann, Associate Registrar
David Laude, Sr. Vice Provost, via Kati Pelletier
DOCUMENTS OF THE GENERAL FACULTY

PROPOSED CHANGES TO THE BS IN COMPUTER SCIENCE INTEGRATED PROGRAM
ADMISSIONS IN THE COLLEGE OF NATURAL SCIENCES SECTION IN THE UNDERGRADUATE
CATALOG 2014-2016

Dean Linda A. Hicke in the College of Natural Sciences has filed with the secretary of the Faculty Council the following changes to the College of Natural Sciences section in the Undergraduate Catalog, 2014-2016. On September 4, 2013, the faculty in the Department of Computer Science approved the changes. The faculty of the college and the dean approved the changes on September 25, 2013, and September 30, 2013, respectively. The secretary has classified this proposal as legislation as being of general interest to more than one college or school (but not for submission to the General Faculty).

The Committee on Undergraduate Degree Program Review recommended approval of the change on January 29, 2014, and forwarded 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. 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 February 21, 2014.

Dean P. Neikirk, Secretary
General Faculty and Faculty Council

Posted on the Faculty Council website (http://www.utexas.edu/faculty/council/) on February 7, 2014.
PROPOSED CHANGES TO THE BS IN COMPUTER SCIENCE INTEGRATED PROGRAM
ADMISSIONS IN THE COLLEGE OF NATURAL SCIENCES SECTION IN THE UNDERGRADUATE
CATALOG 2014-2016

Type of Change  Academic Change

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

2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE (include page numbers in the catalog where changes will be made):
   A. Rationale, Master of Science in Information Studies: The Department of Computer Science (CS) and the School of Information (iSchool) will select highly motivated students with strong intellectual capacities and character for this integrated program in order to meet a two-fold goal: to prepare students for professional positions that require diverse perspectives on information, leadership, and technical depth as well as to prepare students for competitive PhD programs in computer science and information studies.

   The department's Bachelor of Arts (BA) and Bachelor of Science (BS) programs provide students with general knowledge and skills appropriate for many career paths. The department prepares students with a strong foundation in computing. However, as computing moves into the mainstream, successful developers and managers must understand information, interfaces, and interaction from a user's perspective as well. The iSchool complements the department's focus on data with a strong emphasis on information, its social construction, and its contexts of use. The BSCS/MSIS Integrated Program will provide these students with a well-rounded education and will enable system as well as the user perspectives on systems.

   The breadth of topics covered as well as degrees in two disciplines will enable the students of this BSCS/MSIS integrated program to seek admission to the nation's most competitive PhD programs in computer science as well as information studies. The BCS/MSIS Integrated Program will provide these students with a strong background in areas of computer science as well as information studies that are on the frontiers of research, as well as opportunities for theses or projects that blend the knowledge gained from each discipline.

   Students who seek professional positions will also benefit from the proposed BSCS/MSIS Integrated Program. The department's BA and BS programs prepare students for entering the software industry in job profiles that include application development and testing. Students enrolling in the BCS/MSIS Integrated Program will develop skills in human-computer interaction design, user experience design, information architecture, and the design, development, and management of digital services in governmental, academic, or corporate institutions. Appendix A lists job titles that are advertised for graduates from programs similar to the MSIS program in the iSchool.

   The department and the iSchool looked at several resources for guidance in structuring the BCS/MSIS Integrated Program. Most integrated programs provide a fast track to a master's degree within a single department or a program. The Fifth Year Master's Program at Carnegie Mellon University, offered within the computer science department, equips its graduates with a skill set similar to that envisioned by the proposed BSCS/MSIS Integrated Program. The only program across our two disciplines that we have been able to locate is the 3+1 program at Simmons College, which awards the BS-CS and MLIS degrees to a candidate in a span of four years.
The current proposal follows the general structure and guidelines of the joint BS CS/MS CS program that the department currently offers. The BSCS/MSIS Integrated Program will not require significant new costs, nor will the program cause duplication or adverse effects on current programs.

B. Rationale: Master of Science in Computational Science, Engineering, and Mathematics (CSEM):

The Department of Computer Science and the Institute for Computational Engineering and Sciences (ICES) will select highly motivated students with strong intellectual capacities and character for this integrated program in order to meet a two-fold goal: to prepare students for professional positions that require diverse perspectives on computation, engineering, math and technical depth as well as to prepare students for competitive PhD programs in computer science, engineering and mathematics.

The CS department's Bachelor of Arts (BA), Bachelor of Science (BS) and Bachelor of Science and Arts (BSA) programs provide students with general knowledge and skills appropriate for many career paths. However, as computing moves into the mainstream, successful developers and managers must understand the applications of computing to a diverse set of problems, and the underlying algorithms that are the basis for numerical analysis. ICES complements UTCS' focus on data with a strong emphasis on mathematics, scientific computing, and the applications of computing to real world problems. The BSCS/CSEM Integrated Program will provide these students with a well-rounded education enabling them to not only understand the fundamental science of computing, but how computing is used to tackle challenging problems.

The breadth of topics covered, along with the degrees earned in each of the two disciplines, will enable the students of the BSCS/CSEM Integrated Program to seek admission to the nation's most competitive PhD programs in computer science, applied mathematics, and computational science and engineering. The BSCS/CSEM Integrated Program will provide students with a strong background in computer science mathematics, and a technical application area. This educational experience will expose students to the frontiers of research. Participating students will have opportunities for theses or projects that blend the knowledge gained from each discipline.

Students who seek professional positions instead of pursuing doctoral studies will also benefit from participation in the proposed BSCS/CSEM Integrated Program. UTCS' BA, BS, and BSA degree plans prepare students to enter the software industry in job profiles that include software developer, systems analyst, database manager, applications engineer, Internet network technician, business analyst, and project manager. Students in the BSCS/CSEM Integrated Program will develop skills to gain employment in an even broader spectrum of job profiles, including numerical analysis, mathematical modeling, scientific computation, and high-performance computing.

UTCS and ICES used several resources in structuring the BSCS/CSEM Integrated Program. The University of Illinois at Urbana-Champaign offers a bachelor's degree in Mathematics and Computer Science that prepares students to pursue professional or graduate work in mathematics and computer science. Stanford University offers an interdisciplinary bachelor's degree in Mathematical and Computational Science and a Master of Science in Mathematical and Computational Engineering, though neither of these programs is quite the same as what we are proposing here. Harvard University recently began an intensive one-year degree program leading to a Master of Science in Computational Science and Engineering. Central Washington University offers a Master of Science in Computational Science, which targets undergraduate CS majors. Many universities offer similar masters degrees, but not tied directly to an undergraduate program in CS. Furthermore, a number of universities including UT Austin offer certificates in computational science as part of an undergraduate degree program (however, at UT, this does not lead to a master's degree and does not include graduate level courses).

This proposal follows the general structure and guidelines of the joint BS CS/MS CS program that UTCS currently offers. The BSCS/CSEM Integrated Program will not require significant new costs, nor will the program cause duplication. No adverse effects on current programs are anticipated.
3. **SCOPE OF PROPOSED CHANGE**

   a. Does this proposal impact other colleges/schools? [Yes]
      If yes, then how?
      1. A small handful of Computer Science majors will enroll in Information Studies graduate courses.
      2. A small handful of Computer Science majors will enroll in Computational Science, Engineering, or Mathematics graduate courses. Some of these courses may be in Engineering.

   b. Will students in other degree programs be impacted (are the proposed changes to courses commonly taken by students in other colleges)? [Yes]
      If yes, then how?
      1. A small handful of Computer Science majors will enroll in Information Studies graduate courses.
      2. A small handful of Computer Science majors will enroll in Computational Science, Engineering, or Mathematics graduate courses. Some of these courses may be in Engineering.

   c. Will students from your college take courses in other colleges? [Yes]
      1. A small handful of Computer Science majors will enroll in Information Studies graduate courses.
      2. A small handful of Computer Science majors will enroll in Computational Science, Engineering, or Mathematics graduate courses. Some of these courses may be in Engineering.

   **If 3 a, b, or c was answered with yes:**
   How many students do you expect to be impacted? Maybe three in each program
   Impacted schools must be contacted and their response(s) included:
   Person communicated with:
   1. Andrew Dillon, Dean, School of Information
   2. J. Tinsley Oden, Director, Institute of Computational Engineering and Sciences; CSEM Graduate Studies Committee.
   Date of communication:
   1. April 24, 2012 and September 7, 2012
   2. July 31, 2013
   Response:
   1. This is an innovative combination of disciplines and will contribute to the reputation of both academic units.
   2. Approved by the CSEM Graduate Studies Committee.

   d. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? [No]

   e. Will this proposal change the number of hours required for degree completion? [No]

4. **COLLEGE/SCHOOL APPROVAL PROCESS**

   Department approval date: September 4, 2013
   College approval date: September 25, 2013
   Dean approval date: September 30, 2013
Admission and Registration

The Integrated Program in Computer Science

The Integrated Program is a curriculum of undergraduate and graduate coursework that allows the student to earn 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 degrees at the same time. The curriculum integrated Master of Science in Computer Science includes the same coursework as the traditional master’s degree program, as well as the opportunity for research. The integrated Master of Science in Information Studies allows students to choose a pathway for completing a capstone and electronic portfolio, comprised of a professional experience project, a master’s report, or a thesis. The integrated Master of Science in Computational Science, Engineering, and Mathematics includes the same coursework as the traditional computational sciences, engineering and mathematics master’s degree program and also offers opportunity for research.

Students in the Integrated Program are expected to become leaders in the profession. Highly motivated students with the personal qualities and intellectual capacity to establish successful careers in higher education and industry are encouraged to apply.

Undergraduates typically follow option I, II, or III for their first three years, then enter the Integrated Program in their fourth year. Admission is granted only for the fall semester; January 2 is the application deadline for those who wish to begin the program the following fall. By the end of the spring semester in which they apply, students must have completed at least sixty semester hours of coursework, including Computer Science 345 or 345H, 429 or 429H, and 353 or 357 or 357H.

Admission is based on the applicant’s grade point average, letters of recommendation, statement of purpose, and SAT Reasoning Test or ACT scores, as well as other relevant examples of academic ability and leadership. An applicant with a University grade point average of less than 3.50 is unlikely to be admitted. Admission may be restricted by the availability of instructional resources. Application materials and information about deadlines are published by the Department of Computer Science, available at http://www.cs.utexas.edu/.

Before beginning the fifth year, students in the Integrated Program must be admitted to the Graduate School and the graduate program in the Department of Computer Science, the School of Information, or the Institute of Computational Science, Engineering, and Mathematics. Application forms must be completed by January 2 of the student’s fourth year. Before the application deadline, students must have completed the prescribed work common to all Bachelor of Science in Computer Science options. They must earn an acceptable score on the Graduate Record Examinations General Test (GRE) and must have their test scores reported to the University. Students usually take the GRE in the fall semester of their fourth year.