

MINUTES OF THE UNDERGRADUATE CURRICULUM COMMITTEE MEETING
September 4, 2002

PRESENT: Dowling (COA), Finkelstein (PHYS), Guzdial (COC), Hughes (ECE), Jarrett (COA), Kingsley (PUBP), Lacy (MATH), Lynch (ME), McMath (V. PROVOST), McIver (REG), Moran (CHEM), Parsons (MGT), Schneider (DCOM), Tone (HTS)

VISITORS: Craig (for Sankar AE), Eiselt (COC), Foley (COC), Hoey (ASSMT), Marr (PSYCH)

This was a called meeting to consider a proposal based on a request from the College of Computing that had been tabled at the meeting of August 28, 2002.

1. Chairman Hughes opened the discussion on a proposal, distributed by email prior to the meeting, to address several issues related to the definition of Core Area B, the general education requirements in computer literacy, and transfer computer science courses.

An extended discussion ensued. Specific issues included University System requirements on the transferability of core courses, the proposed definition of Core Area B for programs without free electives, whether or not this proposal would require programs to change current degree requirements, and the effect of the proposed changes on transfer students. Several minor modifications were suggested for the wording of the proposal.

A motion was made to approve the following:

1. Redefine Core Area B as follows: 3 credit hours of free electives, plus 1 excess hour from Core Area A.
2. Create CS 15xx, Transfer Introductory Programming (3-0-3), as defined in the August 27 CoC memo, and deactivate CS 17xx and CS 18xx. Students who have already received transfer credit for CS 17xx/18xx will be allowed to keep it, even if the course equivalency is changed to CS 15xx in the future.
3. Policy: All undergraduate degree programs shall include required coursework to ensure that graduates have satisfied the Georgia Tech general education requirements in computer literacy, including computer programming and achievement of a majority of the specified outcomes at an appropriate level. This may be accomplished (a) by requiring a course (specified or selected from a list of options) that has been approved by the IUCC as satisfying this requirement or (b) through the combined content of two or more required courses, approved by the IUCC.
4. All courses currently approved as satisfying Core Area B (COE 1361, CS 1321 and its predecessor numbers, CS 13x1, CS 17xx, CS 18xx, and *Intro. Media Computing* in Spring 2003) shall be deemed to satisfy the general education requirement for computer literacy, with respect to option (a) under item 3. CS 15xx would not satisfy the general education requirement.
5. Programs seeking to allow students to use CS 15xx (or other computing/programming courses not approved as satisfying the general education requirements) to satisfy the policy in item 3 must request approval under option (b).
6. In the initial implementation of this proposal, the BSME and BSNRE degrees will be allowed to use 3 credit hours of technical electives for Core Area B.

The motion was seconded and approved. Unanimous.

2. Hughes presented the draft of an information handout that he proposed to distribute the academic units later in the week. This handout summarizes the proposal and provides a question-and-answer discussion of the effects of these changes on degree programs. This handout will be distributed to provide additional information prior to the Academic Senate meeting on September 17 and to aid programs in considering possible modifications to degree requirements in time for consideration at the Committee's October meeting on curriculum matters. Members were

asked to send any comments or corrections to Hughes. A copy is attached to these minutes.

Adjourned,

Joseph L.A. Hughes
Chair

JLAH:am
Addendum attached

Proposed Revision to Core Area B Requirements and Satisfaction of General Education Requirements in Computer Literacy

September 6, 2002

On September 4, 2002, the Institute Undergraduate Curriculum Committee (IUCC) approved the following proposal related to Core Area B and introductory computing/programming courses. These changes will be brought to the Academic Senate meeting on September 17 for approval. This document is intended to summarize the effects of these changes and provide guidance to programs that may wish to modify their existing degree requirements with respect to introductory computer science courses.

7. Redefine Core Area B as follows: 3 credit hours of free electives, plus 1 excess hour from Core Area A.
8. Create CS 15xx – Transfer Introductory Programming (3-0-3), as defined in the August 27 CoC memo, and deactivate CS 17xx and CS 18xx. Students who have already received transfer credit for CS 17xx/18xx will be allowed to keep it, even if the course equivalency is changed to CS 15xx in the future.
9. Policy: All undergraduate degree programs shall include required coursework to ensure that graduates have satisfied the Georgia Tech general education requirements in computer literacy, including computer programming and achievement of a majority of the specified outcomes at an appropriate level. This may be accomplished (a) by requiring a course (specified or selected from a list of options) that has been approved by the IUCC as satisfying this requirement or (b) through the combined content of two or more required courses, approved by the IUCC.
10. All courses currently approved as satisfying Core Area B (COE 1361, CS 1321 and its predecessor numbers, CS 13x1, CS 17xx, CS 18xx, and *Intro. Media Computing* in Spring 2003) shall be deemed to satisfy the general education requirement for computer literacy, with respect to option (a) under item 3. CS 15xx would not satisfy the general education requirement.
11. Programs seeking to allow students to use CS 15xx (or other computing/programming courses not approved as satisfying the general education requirements) to satisfy the policy in item 3 must request approval under option (b).
12. In the initial implementation of this proposal, the BSME and BSNRE degrees will be allowed to use 3 credit hours of technical electives for Core Area B.

Last year, a subcommittee of the Institute Undergraduate Curriculum Committee completed its review of Georgia Tech's general education requirements for all undergraduate degree programs. The final report identified the following objectives and outcomes related to computer literacy:

Computer Literacy Objective: Georgia Tech students will be able to use appropriate software applications effectively, demonstrate an understanding of the organization and operation of computer systems, and apply programming techniques to solve problems.

Outcomes

Students will be able to:

1. Use software to develop, modify, visualize, share, and present graphical and textual information
2. Use numerical analysis and database software to organize, process, and analyze information
3. Describe the basic operation and organization of major computer hardware and software components, and the networking environments in which they operate.
4. Design and implement algorithms to solve problems using structured programming techniques
5. Design and implement a data representation that facilitates problem solving
6. Estimate the complexity of basic algorithms and distinguish between reasonable and unreasonable approaches

In summary, what do these changes accomplish?

These changes have three major effects: (1) separating the general education requirements in computer literacy from the degree requirements in Core Area B, (2) modifying the transfer computer science courses to distinguish between those that satisfy the general education requirements and those that don't, independent of the computer language used, and (3) providing programs more flexibility in constructing their degree requirements, while maintaining a requirement for computer programming and literacy.

What is the effect on degree programs of changing the Core Area B requirement?

This change is purely administrative, with three hours of free electives being designated to satisfy this requirement instead of CS 1321. For the current programs without free electives, BSME and BSNRE, technical electives are designated to satisfy Core Area B. CS 1321 will continue to be a degree requirement, unless the program changes its degree requirements, as discussed below.

Which Georgia Tech courses satisfy the general education requirements in computer literacy?

The IUCC has approved the following courses offered at Georgia Tech as satisfying the general education requirements in computer literacy:

- COE 1361 – Computing for Engineers (currently limited to students in certain engineering majors)
- CS 1321 – Introduction to Computing
- Introduction to Media Computing (to be offered in Spring 2003 as a trial version of a course intended primarily for non-science/engineering majors)

What do the various transfer CS courses signify?

If a course is substantially equivalent to one of the Georgia Tech courses listed above, then the student receives credit for the Georgia Tech course. Several additional course numbers have been defined to correspond to computer science courses taken elsewhere that do not match the courses offered at Georgia Tech.

CS 13x1 is awarded for introductory computer courses that satisfy the general education requirements, including algorithms, static data structures, and a notion of efficiency of solutions. (In addition to these topics, **CS 1321** includes dynamic data structures and recursion.) **CS 13x2** normally is awarded for the second course in a sequence that continues the coverage from CS 13x1 to include these additional topics. **CS 15xx** is awarded for introductory programming courses that do not meet the general education requirements. Such courses typically focus on the syntax and semantics of a particular programming language rather than the fundamental computation concepts of algorithms and data structures. CS 13x1 and CS 15xx are not sufficient as prerequisites for CS 1322; however, the combination of CS 13x1 and CS 13x2 is a prerequisite for CS 1322.

Does this change REQUIRE programs to do anything now to satisfy the policy statement in item 3?

No change is necessary. All undergraduate degree programs currently require CS 1321, so they satisfy the policy statement in item 3 using option (a).

However, programs that wish to add options, such as COE 1361, should request a modification of their degree requirements, as described below. Since a new edition of the Georgia Tech *General Catalog* will be printed for 2003-2005, it would be desirable to propose such changes prior to the deadlines this fall.

What type of change in degree requirements might programs want to consider?

Some programs may choose to replace CS 1321 with a different course, such as requiring COE 1361.

Some programs may choose to allow students to select from among certain specified courses; e.g., an engineering program might require “CS 1321 or COE 1361”. For maximum flexibility, a program might replace CS 1321 with “a 3-credit hour course approved to satisfy the general education requirements in computer literacy.” In advising materials and catalog text, such programs may recommend a specific course, but allow credit for any of them.

In all of these examples, the program continues to satisfy the policy statement in item 3 using option (a).

Why would a program choose to satisfy the policy statement in item 3 using option (b)?

The most likely reason would be to increase flexibility for transfer students entering the program. Some programs already cover most of the general education requirements in computer literacy through labs or other required coursework in the major. For such programs, a language-oriented programming course (which transfers as CS 15xx) taken at another institution may be sufficient to complete the general education requirements in computer literacy.

The other reason is that option (b) provides programs with greater flexibility in designing curricula. Thus, in a future curriculum revision, a program may propose to teach computer programming and the other aspects of the general education requirements in computer literacy as part of an integrated sequence of required courses in the major, rather than requiring a separate course taught by another unit.

How do these policies affect students who change majors?

In general, students must complete all of the degree requirements of the major in which they receive their degree. If a student takes CS 1321 to satisfy the requirements of their initial major, but changes to a major that requires COE 1361, then he or she

will need to take COE 1361. This is the same policy as if the student had completed a biology course to satisfy a science requirement, but then changed to a major that requires physics.

If a program wishes to provide greater flexibility, then its degree requirements should be defined to provide that flexibility for all students in the major. The IUCC generally has enforced a policy that options in satisfying degree requirements must be made available to all students.

How do these policies affect transfer students?

The effect of these policies on transfer student largely depends on the choice their major program makes as to how it will satisfy the policy requirement in item 3. Many transfer students still will be required to take one or more computing/programming courses at Georgia Tech in order to complete degree requirements.

If a program satisfies the policy statement in item 3 using option (a), then it may – at its discretion – choose to allow transfer students to substitute CS 13x1 for the course listed in the degree requirements. Students who receive only CS 15xx credit will be required to complete one of the approved Georgia Tech courses.

If a program satisfies the policy statement in item 3 using option (b), then it must specify the treatment of transfer courses as part of its proposal to the IUCC.

The options are more limited for programs that currently require students to complete both CS 1321 and CS 1322. Such programs may – at their discretion – allow students to substitute CS 13x1 and CS 13x2, although such students do not have the equivalent of CS 1322 for continuing into later courses.

Are there other related issues that have not been addressed by these changes?

Yes. These changes focus on the degree requirement structural issues related to Core Area B and the general education requirements in computer literacy. Other, course-related, issues that have not been fully addressed include the following: (1) creation of new courses targeted at various majors; (2) “bridge courses” between course options/sequences; and (3) additional options for transfer students, particularly in majors that require two or more computer science courses.

What if we have questions that are not answered by this information sheet?

Questions may be sent via email to Dr. Joseph Hughes, 2002-03 IUCC Chair, or to Ms. Jo McIver, Registrar, at

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