

TEXAS HIGHER EDUCATION COORDINATING BOARD
Summary Notes/Minutes
Computer Science & Information Technology Field of Study Advisory
Committee Meeting
1200 East Anderson Lane, Board Room
Austin, Texas
February 11, 2019, 1:00 PM – 5:00 PM

A webcast of this meeting is available at the following link:
<https://www.youtube.com/watch?v=ARmECfqBwEI>

1. Call to order

Allen Michie called the meeting to order at 1:00 PM.

The following committee members were present:
Mircea Agapie, Tarleton State University
Anila Das, Navarro College
Marie-Anne Demuynck, Texas Woman's University
Ginger Dennis, Kilgore College
Scott King, Texas A&M University-Corpus Christi
Stephen Lyford, Wharton County Junior College
Simeon Ntafos, The University of Texas at Dallas
Heather Sanders, Midland College
Richard Sellers, Tarrant County Community College/Northeast Campus
Christian Servin, El Paso Community College (committee co-chair)
Hank Walker, Professor, Texas A&M University (committee co-chair)

The following committee members were absent:
Linda Barasch, The University of Texas at Arlington
Mike McHugh, Blinn College
Bruce Porter, The University of Texas at Austin
Apan Qasem, Texas State University
Vassilios Tzouanas, University of Houston-Downtown

Coordinating Board Staff present:
Allen Michie, Program Director
Rex Peebles, Assistant Commissioner for Academic Quality & Workforce

2. Consideration of Meeting Notes for the October 8-9, 2018 meeting

The meeting notes were approved with minor corrections.

3. Discussion of public comments on the proposed Computer Science & Information Technology Field of Study

The committee went through the public comments (in italics) received on the first proposed Field of Study (FOS), which went out to institutions on October 16, 2018.

Brazosport College: Add Programming Fundamentals I (COSC 1436) to the FOS

Walker said that the problem is that adding it would make the FOS too big. The FOS is already 33-34 semester credit hours (SCH), and there were comments about that being a problem. (Note: Programming Fundamentals I was discussed again extensively at the end of the meeting.)

Michie clarified some issues about FOS. Credits for an FOS course must apply toward the degree, but each receiving institution decides where in the degree to apply them and decides on possible course equivalencies. Receiving institutions can have minimum grade requirements for accepting courses for transfer. Students can still complete an associates degree with a completed FOS but an incomplete core curriculum.

Texas A&M University-San Antonio: Remove Discrete Math (MATH 2305) from the FOS

The committee voted against this recommendation in an earlier ballot.

Texas State University: Create an ACGM course in Computer Ethics and add it to the FOS

Servin suggested adding a course in computer ethics, and Walker replied that many schools already have an ethics course later in the curriculum. Servin said that community college courses often contain an element of computer ethics.

The committee voted against this recommendation in an earlier ballot.

The University of Texas School of Biomedical Informatics: Reconsider the Physics requirements (PHYS 2425 and 2426)

Walker said that several comments asked to reconsider the science requirements, particularly Physics. (Note: the issue is discussed in various places throughout the meeting.)

The committee voted against this recommendation in an earlier ballot.

The University of Texas School of Biomedical Informatics: Add a course on algorithms to the FOS

The committee voted against this recommendation in an earlier ballot.

The University of Texas School of Biomedical Informatics: Add a course in hardware to the FOS

Walker said that no one was in favor of adding this since the course material is largely included in COSC 2425/2325. Institutions are moving away from the C programming language.

The committee voted against this recommendation in an earlier ballot.

Collin College: Remove Computer Organization (COSC 2325 and 2425) from the FOS

Servin said this course provides flexibility to provide the credits, and many universities offer it at the upper division. Walker said the institutions that teach it at the lower division need the course in the FOS. Ntafos said he would like the course to be removed, since some students would probably have to take the upper-division course even if they bring in COSC 2325/2425. New accreditation requirements ask for more upper-division courses. Agapie said that hardware is deemphasized, and digital circuits are a lot to cover, so computer architecture should be an upper-division course.

Ntafos said that universities will need to add 2-3 new upper-division classes to meet new accreditation guidelines. He asked if a university has 70 SCH of lower-division courses, and a transfer student comes in FOS complete, if that means the student would be given 70 SCH of credit.

The committee voted against this recommendation in an earlier ballot.

Alvin College: Add additional Computer Science courses to the FOS

Walker said this has already been discussed.

The committee voted against this recommendation in an earlier ballot.

Alvin College: Remove the option to take either the 3 or 4 SCH version of Computer Organization (COSC 2325/2425).

Servin said the FOS needs to stay at 30 SCH.

Michie asked the committee to consider whether the 3 or 4 SCH is better for students, and he pointed out that an option between the two will cause problems for Registrars and will probably default to the 3 SCH version in student choice. Walker replied that 3 SCH is probably adequate given the decline of hardware as an issue. The issue depends on the schools and what they offer. Dennis asked how many schools offer it at the upper-division level. Walker replied that schools of Engineering need to have the course at the upper division. Servin said that cybersecurity should be included in the learning outcomes, and Ntafos said cybersecurity is included in the new Accrediting Board for Engineering and Technology (ABET) certification guidelines, and Computer Architecture is a key course in that curriculum. Servin said that the 4 SCH version will satisfy accreditors and work for the four-year institutions that require it.

The committee voted against this recommendation in an earlier ballot.

University of North Texas: Add a Probability course to the FOS

Walker said that the FOS needs to be for all Computer Science programs.

The committee voted against this recommendation in an earlier ballot.

Ntafos, Walker and others asked general questions about FOS purposes and policies. Peeble replied that the intention of FOS is to deal with the lower-division courses required for a major. For example, if an Engineering school requires Economics, that is a requirement. Then if Economics is not in the FOS, an institution could not require that student to take Economics. The FOS would replace the lower-division requirements. If there is a lower-division requirement outside the major, like an institutional or college requirement, then those can be required in addition to the FOS. State law says that the FOS must substitute for the lower-division requirements for the major. If a course is required for all Engineers, then it should be included in the Computer Science FOS. Walker said that different schools serve different communities, so they have different courses and requirements. Peebles responded that the FOS statute asks institutions to think state-wide. Some institutions are more rigorous than others, but this is a way for four-year institutions to tell the colleges that this is what students need to be prepared and successful.

University of North Texas: Add ENGL 2311 Technical & Business Writing (ENGL 2311) to the FOS

Walker noted this is a core curriculum course at Texas A&M University and at other institutions.

The committee voted against this recommendation in an earlier ballot.

University of North Texas: Add a course in Digital Logic to the FOS

The committee voted against this recommendation in an earlier ballot.

University of North Texas: Add Linear Algebra (MATH 2700) to the FOS

Qasem said this is an upper-division course at Texas State University and other institutions.

The committee voted against this recommendation in an earlier ballot.

Temple Junior College: Offer a menu of choices between COSC 2325, 2425, 1336, and 1436

Servin said these could be choices for the Computer Organization section of the FOS. The committee discussed whether there should be consistency across the choices in either the 3 SCH or the 4 SCH versions of the courses. Walker said the trend at community colleges is to offer the 4 SCH versions. Committee members reviewed the offerings at their own institutions. The consensus was that the 4 SCH version should be required.

The committee voted against this recommendation in an earlier ballot.

The University of Texas at San Antonio: Remove Programming Fundamentals III (COST 2436) from the FOS

The committee voted against this recommendation in an earlier ballot.

South Texas College: Offer a choice of science courses other than Physics

Walker said there was a close vote on the science options. The original proposed FOS had two Physics courses. It is common for non-Engineering schools to offer more of a menu of options. Ntafos said that Calculus and Physics are requirements almost everywhere, and Physics II is necessary. Walker noted that ABET does not require Physics and gives options to students, depending upon whether student emphasis is on hardware or applications. Demuynck proposed having students take 6 or 8 SCH in the same field, such as Biology I and II, or Chemistry I and II.

Dennis said that the Science courses are already in the core curriculum, so they could be left out of the FOS. Agapie replied that if the FOS does not specify the Science courses, students could take the versions for non-Science majors. Walker added that students could also take courses that are not suitable for Computer Science majors. King said that ABET requires instruction in scientific method and laboratory skills, and not all science courses in the core have those. Walker noted that there is no such thing as Calculus-based Biology.

Agapie suggested making Geosciences one of the options. Demuynck add that if the FOS has only Physics, it would be limiting the number of students who will be interested in Computer Science. If the trend is away from hardware, then why would the FOS be limited only to Physics? Walker responded that students may lose interest if they have to take just Physics.

South Texas College: Offer a choice of science courses other than Physics and then remove Calculus II (MATH 2414) from the FOS and add Programming Fundamentals I (COSC 1436)

South Texas College: Add Programming Fundamentals I to the FOS and remove a Math class

McLennan Community College: Require the 3 SCH versions for Programming Fundamentals II and III (COSC 2325/2425)

The committee discussed the three recommendations as a set. The committee voted against these recommendations in an earlier ballot.

Walker said he does not know of any schools that do not require both Calculus I and Calculus II.

Ntafos said the trend is away from Programming Fundamentals I (COSC 1436). Barasch said that some students stop at Algebra II-Trigonometry. Ntafos said there is variation among community colleges, and Walker said that about a quarter of the students he has taught were not Calculus ready. Walker said that COSC 1436 is currently a hidden prerequisite in the FOS, and the comments are about making it an explicit requirement. The reason why COSC 1436 was left out in the original FOS was because of concern about the size of the FOS, not because it was an unimportant course.

Barasch said that if a student has COSC 1436, The University of Texas at Arlington does not apply it toward the degree program. Walker said that if Programming Fundamentals II is the

first required course in the sequence, it is assumed that students have had the content of Programming Fundamentals I somewhere along the way.

Michie pointed out that COSC 1436 is offered at a modest number of colleges and universities. It is required at 5 of the 10 top transfer-receiving institutions.

Peebles urged committee members to be careful about prerequisites in the FOS. If committee members can reasonably expect students to get necessary course content in high school, then the course does not need to be in the FOS. For example, if Calculus I is considered the first course in Engineering, then it is reasonable to expect that high school students have the skills needed for Calculus I. If some students do not have the content, then they can take leveling courses outside of the FOS that will not be credited toward the degree. If the introductory course is included in the FOS, then institutions must apply the SCH toward the degree. If a student takes the 4 SCH version when only the 3 SCH version is required, they will just have an extra SCH at graduation and no harm is done—the goal is to not have the student take an entire additional unnecessary course.

Ntafos brought up the concern that students completing a FOS and the core may have too many undergraduate hours, whereas accrediting agencies say that students must have at least 51 hours of upper-division courses.

Ntafos made a motion to table the FOS until someone can explain how it would apply in transfer to a variety of institutions and until the committee knows what the ABET accreditation requirements are.

In discussion, Ntafos said that course equivalencies are moving targets. Agapie said that it is impossible to know what is being covered in high schools. Peebles responded that the FOS needs to be based on the high school curriculum as given by the state, not on the number of high schools that follow it. For example, some rural districts may not get to teach Calculus or Algebra II-Trigonometry. Peebles said that discussion is revolving too much around “what we do” vs. “what they do,” and the committee is not thinking through the issue of what the students need to be prepared at the upper-division level. There is a consensus that the FOS needs Programming Fundamentals II. The issue is therefore Programming Fundamentals I and whether there is a realistic assumption that most students get it in high school or can get it in a leveling course if they came from an under-performing high school. Walker said that only a fraction of high schools teach Programming Fundamentals I.

King pointed out that there is already a Computer Science FOS, so if the proposed FOS is tabled, the current one remains in effect.

Barasch said that some students can place out of the course. Sanders said that financial aid will only pay for a course if it is in the degree plan. Peebles added that financial aid will pay for developmental education courses.

Peebles asked what ABET would do if Programming Fundamentals I was required. Barasch said that The University of Texas at Arlington just passed an ABET accreditation without offering Programming Fundamentals I.

The motion to table the proposed FOS failed, 4-8.

A motion was made to include Programming Fundamentals I (COSC 1436) in the 4 SCH version. The motion carried, 9-3.

A motion was made to retain Physics I and Physics II in the FOS, without a menu of other science course options. The motion carried, 7-4.

A motion was made to keep the FOS as it was sent out for public comment, with the addition of Programming Fundamentals I. The motion carried, 11-1.

4. Consideration of authorization of Co-Chairs to approve the meeting notes for this meeting, make non-substantive edits to documents, and conduct assorted committee business relating to submission of the Field of Study to the Coordinating Board for approval

A motion was made and carried unanimously.

5. Adjournment

The meeting adjourned at 5:00 PM.

Final proposed FOS:

Course Title	Course Number	SCH
University Physics I (lecture + lab)	PHYS 2425	4
University Physics II (lecture + lab)	PHYS 2426	4
Calculus I (4 SCH version)	MATH 2413	4
Calculus II (4 SCH version)	MATH 2414	4
Discrete Mathematics	MATH 2305	3
Programming Fundamentals I (4 SCH version)	COSC 1436	4
Programming Fundamentals II (4 SCH version)	COSC 1437	4
Programming Fundamentals III (4 SCH version)	COSC 2436	4

Choose one of the courses below: <ul style="list-style-type: none"> • Computer Organization (3 SCH version) • Computer Organization (4 SCH version) 	COSC 2325 COSC 2425	3-4
TOTAL		34-35