

**TEXAS HIGHER EDUCATION COORDINATING BOARD**  
**Summary Notes/Minutes**  
**Chemistry Field of Study Advisory Committee Meeting**  
**1200 East Anderson Lane, Board Room**  
**Austin, Texas**  
**October 10, 2019, 1:00 PM – 5:00 PM**

*The webcast of the meeting is available at the following link:*

<https://www.youtube.com/watch?v=xMmYt4ff71I>

**Note: The meeting was originally scheduled and advertised for two days, October 10 and 11, 2019, but the committee completed their work on October 10.**

**1. Call to order and introductions**

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

The following committee members were present:

Jeffrey Allison, Austin Community College  
Maria Benavides, University of Houston-Downtown  
Fereshteh Billiot, Texas A&M University-Corpus Christi  
Beverly Clement, Blinn College District  
Gregg Dieckmann, The University of Texas at Dallas  
Catherine Elueze, Kilgore College  
Holly Gaede, Texas A&M University  
Shelley Hampe, Weatherford College  
Mark Haney, Navarro College  
Alicia James, Lone Star College-Kingwood  
Michael Janusa, Stephen F. Austin State University  
Kameron Jorgensen, Texas A&M International University  
David Laude, The University of Texas at Austin  
George Liang, Midwestern State University  
Karlos Moreno, South Texas College  
Prakash Nair, Northwest Vista College  
Aderemi Oki, Prairie View A&M University  
Luis Reyes, Tarrant County College-Northwest Campus  
Steven Salvato, Central Texas College  
Bang Wang, South Plains College  
Thomas West, Texas A&M University-Commerce  
Darren Williams, Sam Houston State University  
Sheuli Zakia, Laredo College

The following committee members were absent:

Peter Bell, Tarleton State University

Coordinating Board Staff present:  
Allen Michie, Program Director  
Rebecca Leslie, Program Director  
Reinold Cornelius, Director, Undergraduate Studies

## **2. Consideration of appointing a recording secretary**

Mark Haney volunteered to serve as recording secretary and was elected by acclamation.

## **3. Consideration of election of co-chairs**

Beverly Clement was nominated to serve as co-chair from two-year institutions and was elected by acclamation. Aderemi Oki was nominated from four-year institutions and was elected by acclamation.

## **4. Public testimony**

No one was available for public testimony.

## **5. Break for consultation between Coordinating Board staff and Co-Chairs**

The committee recessed for 15 minutes.

## **6. Overview of Field of Study rules and mission – Dr. Allen Michie**

Michie provided an overview of the Fields of Study (FOS) statute, how it is part of a wider range of transfer success initiatives, and how it contributes to the Texas Higher Education Coordinating Board's *60x30TX* strategic plan.

Michie stated the goals of the meeting:

- Review curricula from programs at representative two- and four-year institutions
- Review approved courses in the *Lower-Division Academic Course Guide Manual (ACGM)*
- Decide which lower division courses are necessary for success in upper division courses in a major
- Adjust course objectives and descriptions as necessary
- Balance student freedom with institution priorities
- Create a guaranteed pathway to the degree and minimize the number of excess hours that students take

Michie answered questions about FOS and the approval process.

## **7. Discussion and consideration of the Chemistry Field of Study curriculum**

Oki suggested reviewing the work that had already been done by the Tuning committee to see if it could serve as a basis for the FOS curriculum.

**Table 1. The 2012 Tuning curriculum for Chemistry**

<b>Community College Program of Study for Transfer to a Chemistry Program</b>			
<b>FRESHMAN YEAR</b>			
<b>First Semester (Fall)</b>		<b>Second Semester (Spring)</b>	
Course	SCH	Course	SCH
MATH 2413 Calculus I	4	MATH 2414 Calculus II	4
CHEM 1311 General Chemistry I	3	CHEM 1312 General Chemistry II	3
CHEM 1111 General Chemistry I lab	1	CHEM 1112 General Chemistry II lab	1
XXXX ##### Texas Core Curriculum Requirement	2	XXXX ##### Texas Core Curriculum Requirement	3
XXXX ##### Texas Core Curriculum Requirement	3	XXXX ##### Texas Core Curriculum Requirement	3
XXXX ##### Texas Core Curriculum Requirement	3	XXXX ##### Texas Core Curriculum Requirement	3
Semester Credit Hours		Semester Credit Hours	
16		17	
<b>SOPHOMORE YEAR</b>			
<b>First Semester (Fall)</b>		<b>Second Semester (Spring)</b>	
Course	SCH	Course	SCH
CHEM 2323 Organic Chemistry I	3	CHEM 2325 Organic Chemistry II	3
CHEM 2123 Organic Chemistry I lab	1	CHEM 2125 Organic Chemistry II lab	1
PHYS 2325 University Physics I	3	PHYS 2326 University Physics II	3
PHYS 2125 University Physics I lab	1	PHYS 2126 University Physics II lab	1
XXXX ##### Texas Core Curriculum Requirement	3	XXXX ##### Texas Core Curriculum Requirement	3
XXXX ##### Texas Core Curriculum Requirement	3	XXXX ##### Texas Core Curriculum Requirement	3
Semester Credit Hours		Semester Credit Hours	
14		14	
<b>Notes:</b>			
1 Texas Common Course Numbers are used for all TCCN-numbered courses.			
2 The student is encouraged to check with the institution to which he/she plans to attend for transferability conditions for CHEM 2325/2125 Organic Chemistry II and its accompanying lab.			
THECB May 2012			

Hampe said an adjustment could be made to the Physics requirement. Williams agreed that College Physics I (PHYS 1401) and University Physics (PHYS 2425) were issues then and will continue to be problems for the FOS. Billiot asked if the FOS can offer a choice between College and University Physics. Jorgensen replied that universities will have to accept whichever course students take, so it would be safer to stick with University Physics. James agreed, saying it would be better for students to be overprepared than to have to take an additional course. Wang clarified that College Physics was required for Bachelor of Arts (BA) majors, and University Physics was required for Bachelor of Science (BS) majors.

The committee discussed the Math requirement. Nair said this was discussed by the Tuning committee, and it decided that the curriculum begins with Calculus I. Michie said that prerequisite courses can be left off of an FOS if it can be safely assumed that most students in the major will have credit for them from high school or place out of them. Allison said that most students start with Pre-Calculus, which along with Algebra, is a prerequisite for Calculus. Williams said that if universities have to accept three semester credit hours (SCH) for Algebra, it would require them to cut classes needed for accreditation. Wang said that students do not typically need Calculus until they get into Physics in the third semester, so Algebra or Pre-

Calculus could be in the core and the FOS could start with Calculus.

Clement asked if any courses should be added to the Tuning curriculum. The committee discussed a course in Quantitative Analysis. Salvato said that there used to be a Quantitative Analysis course in the ACGM, but it was removed. West said that Texas A&M University-Commerce has a course in Quantitative Analysis, but it is at the 3000 level. Janusa said that Quantitative Analysis either needs to be in the FOS, or everyone will have to move the course to the upper division. Benavides said that it is one of five foundational courses for American Chemical Society (ACS) accreditation.

Laude said that when medical schools stopped requiring Calculus, it created a situation where students had to decide if they were serious science students. A similar divide is happening for Chemistry students. If students did not get into Calculus initially, it made them consider whether they wanted to progress as Chemistry majors.

Haney said there is a need for General Biology. He added that Calculus III might be too much. Dieckmann said that Biochemistry is best left to Biology departments and Biochemistry degrees. Liang said that Biochemistry is not pure Biology, and it should have a Calculus I and II focus. Haney said that Biochemistry should have its own FOS.

Clement made a motion to not include Biochemistry in the FOS. The motion carried unanimously.

The committee discussed adding Calculus III (MATH 2415). Allison said that Calculus III is included in the Math FOS. Laude said that University of Texas at Austin students need to have multivariable Calculus. Oki said that it would be difficult to include Calculus III and keep the total SCH of the FOS at a management number. Jorgensen said that Texas A&M International University requires Differential Equations. James and Clement said that a goal of the FOS is to make sure that the students will be successful at the university, and ideally FOS students will be at the same stage as native students at the receiving institution.

Haney said that if the FOS included Calculus III, it would no longer be realistic for students to get through all the courses in two years. Gaede and Dieckmann suggested having two tracks, one for BA students without Calculus III, and one for BS students with Calculus III. Clement said that Calculus III is a necessary prerequisite for Physical Science.

The committee discussed having separate BA and BS tracks. Laude said that many students who go into pre-medical fields or health services fields take the BA. Laude said the BA track has less of a Math requirement, and the Physical Chemistry class does not have a prerequisite of Differential Equations.

Benavides made a motion to have a single FOS for both the BA and BS. In discussion, Dieckmann said that there could be only one FOS for the BA, and then universities could require Calculus III of transfer students who want to do a BS. Laude countered that the BS is the standard degree for Chemistry. Elueze said that low enrollments prevent colleges from offering Calculus III and Differential Equations. The motion carried unanimously.

The committee resumed discussion of Calculus III. Members noted that it is often a prerequisite

for Physical Chemistry, but Calculus III also has low enrollments in some colleges. Haney noted that a Calculus III course would never meet minimum enrollments at Blinn College District, and it is not possible to use the course for dual enrollment. Jorgensen noted that Calculus III is included in other FOS, such as Math and Engineering.

A motion was made to add Calculus III to the FOS. In discussion, Haney expressed concern that leaving it out of the FOS would be deceptive, knowing that students will need the course later, even if some colleges cannot offer it. Benavides and Janusa said Calculus III provides foundational knowledge for Chemistry majors, especially when they take Physical Chemistry. Oki pointed out that the course is not in the Tuning curriculum. Clement said that Organic Chemistry students need Calculus III, and Jorgenson added that if the course is needed by some students, it needs to be in the FOS or otherwise no transfer student can be required to take it. The motion carried unanimously.

A motion was made to include University Physics in the FOS, not College Physics. The motion carried unanimously.

A motion was made to accept the Tuning curriculum, including only University Physics, and including Calculus III, as the FOS. The motion carried unanimously.

A motion was made to have the FOS also apply to programs in Forensic Chemistry. The motion carried unanimously.

## **8. Overview of the timeline for public comments and Field of Study approval – Dr. Allen Michie**

Michie stated that the proposed FOS would go out for a 30-day public comment period. Committee members would be given a copy of each comment for a response. If changes are made, the revised FOS would go out for a second 30-day comment period. The FOS curriculum would go before the Coordinating Board's Committee on Academic and Workforce Success committee and the full Board for final approval.

Michie said that there could be a second committee meeting, depending upon the number and nature of the public comments received and whether committee members indicate that they want to make significant changes.

## **9. Consideration of authorization of Co-Chairs to approve the meeting notes, 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 to authorize the co-chairs to approve the final meeting minutes and carry other related business for the FOS approval process before the Board. The motion carried unanimously.

## 10. Adjournment

The meeting adjourned at 5:00 PM.

**Table 2. Final proposed Chemistry FOS**

<b>Course Title</b>	<b>Course Number</b>	<b>SCH</b>
Calculus I	MATH 2413	4
Calculus II	MATH 2414	4
Calculus III	MATH 2415	4
Choose one of the following: I. University Physics I (lecture + lab) II. A. University Physics I (lecture) B. University Physics I (lab)	I. PHYS 2425 II. A. PHYS 2325 B. PHYS 2125	4
Choose one of the following: I. University Physics II (lecture + lab) II. A. University Physics II (lecture) B. University Physics II (lab)	I. PHYS 2426 II. A. PHYS 2326 B. PHYS 2126	4
Choose one of the following: I. General Chemistry I (lecture + lab) II. A. General Chemistry I (lecture) B. General Chemistry I (lab)	I. CHEM 1411 II. A. CHEM 1311 B. CHEM 1111	4
Choose one of the following: I. General Chemistry II (lecture + lab) II. A. General Chemistry II (lecture) B. General Chemistry II (lab)	I. CHEM 1412 II. A. CHEM 1312 B. CHEM 1112	4

Choose one of the following: I. Organic Chemistry I (lecture + lab) II. A. Organic Chemistry I (lecture) B. Organic Chemistry I (lab)	I. CHEM 2423 II. A. CHEM 2323 B. CHEM 2123	4
Choose one of the following: I. Organic Chemistry II (lecture + lab) II. A. Organic Chemistry II (lecture) B. Organic Chemistry II (lab)	I. CHEM 2425 II. A. CHEM 2325 B. CHEM 2125	4
<b>TOTAL</b>		<b>36</b>