



Memo

To: Randy Smith, Vice Provost for Academic Programs, Office of Academic Affairs

From: Cory Matyas, Assistant Dean for Curriculum and Assessment

Date: November 5, 2025

Re: Informational Item – Chemical & Biomolecular Engineering Program Update

The Department of Chemical and Biomolecular Engineering plans to create a new Chemical Industry technical elective category, requiring 6 credit hours and increasing total technical electives from 12 to 18 hours.

They will remove Chem 2520 (Organic II) and Chem 4300 (Physical Chemistry I) from required courses and introduce CBE 1234 as an alternative to ENGR 1221, focusing on software tools for chemical engineers (course coming soon).

This is a net credit hour decrease from 127 to 126.

Effective AU26.

These changes aim to provide greater flexibility, align with industry needs, and maintain ABET compliance. The Engineering College Committee on Academic Affairs met on November 4, 2025 and reviewed this proposal as an informational item. There were no questions or concerns and a College-level record of support for this proposal was created.

Thursday, October 30th, 2025
Professor Shannon Morrison
Chair of the College Committee for Academic Affairs (CCAA)

Dear Professor Shannon Morrison,

We are writing to request that the CCAA consider the proposed changes to the curriculum for the Department of Chemical & Biomolecular Engineering (CBE) outlined in detail below. The proposed changes were discussed in a series of faculty meetings going back to Spring 2025 semester. A final proposal was developed by the CBE curriculum committee on 09/17/25 with several options. The final discussion and vote took place in the faculty meeting on 10/3/25. Please let us know if you have any questions or need any additional information.

Sincerely,



Aravind Asthagiri
Professor & Associate Chair
William G. Lowrie Department of Chemical & Biomolecular Engineering
The Ohio State University

Proposal for modifying the CBE curriculum (10/30/25):

The following changes to CBE

- (1) Establish a Chemical Industry TE category. **Chemical Industry (CI)** technical electives can come from any combination of approved technical electives that fall under (i) Chemistry or (ii) one of the focus options. More details are found below on allowed CI technical electives; however, the determination of CI technical electives will be under the department control so that we can respond to new directions and student interests in the future.
- (2) The current technical electives are listed on Buckeye Degree Planner as such, totaling at least 12 hours:

04	Standard Requirements	fulfill all at least 12 hours	0 hours
01	Math or Statistics Course	1 constraint	
02	CBE Courses	1 constraint	0 hours
-	Additional Technical Electives >	fulfill if needed	

The new curriculum proposal will increase this new total to at least 18 hours, after the creation of two new elective categories

- Math or Stat elective: 2-4 credits
- 2-- CBE 5000-level
- Additional technical electives
- Chemical Industry elective #1
- Chemical Industry elective #2

- (3) Require students to complete a minimum of 6 credit hours in the CI category
- (4) Remove Chem 2520 (organic chemistry II, 4 credits) as a Required Non-Major General Course
- (5) Remove Chem 4300 (Physical Chemistry I, 3 credits) as a Required Non-Major General Course
- (6) Introduction of a new CBE 1234 course as an alternative course to ENGR 1221. CBE 1234 will focus on the introduction of software tools for chemical engineers (Excel, Python, ASPEN). See attached syllabus and concurrence requests from the CSE and EED departments for approval of this course for Sp27 semester.
- (7) Net change to our credit hour requirements: Go from 127 credit hours to 126 credit hours.

Note: Below are the current rules for our technical electives (the red would be the new addition). Here is also the definition of the currently three focus areas where electives can be chosen for CI (in addition to the chemistry courses) - see <https://cbe.osu.edu/approved-technical-electives> :

~~Twelve~~ **Eighteen** total technical elective credits are required for each student. This includes one math elective, two CBE 5000-level courses, **two approved CI elective courses**, and additional hours needed to meet the ~~twelve~~ **eighteen** total credits.

Effect of proposed change:

- Allow our undergraduate students the option to access more chemical engineering industry focused technical elective courses while retaining the ability to take Chemistry courses for those students interested in that path.
 - Provides flexibility for students to complete the focus options. In addition, students interested in the petroleum minor offered in our department may have an easier path.
 - Department can also modify the focus options to respond to student/industry needs. For example, we could introduce a computational analytics focus that allows students to integrate CBE tech electives in modeling/simulation with offerings in artificial intelligence/machine learning from the CSE and ECE departments.
 - If Chemistry is interested, this may provide an avenue for our interested students to pursue a Chemistry minor by focusing on chemistry courses in their electives.

- Feedback from co-op surveys suggest more courses that focus on industrial aspects in depth would be welcomed.
- Secondary effect will be to allow us to bring the transport sequence up a semester, allowing students to complete this 3-semester sequence before the start of the senior year courses. This is a more ideal arrangement where all the fundamental core CBE courses in thermodynamics, transport, and kinetics are finished before the senior-level courses. See change in bingo sheet below for these details.
- We still satisfy the ABET requirements for math/science of at least 30 semester credit hours (or equivalent) of college-level mathematics and basic sciences, including physics and chemistry with laboratory experience. We would have 34 credit hours (down from 41 credit hours) – see below for the list of courses. Note we also have one 3 credit hour elective that is an advanced math/stats elective (usually CBE 5779).

Chem 1210, 1220 (10 credit hours), Chem 2510 (4 credit hours), Chem 2540 (2 credit hours, lab course), Math 1151, 1172 (10 credit hours), Math 2173 (3 credit hours), Physics 1250 (5 credit hours)

Please see below for the changes to the program's curriculum sheet.

Bachelor of Science Chemical Engineering

[Brief description of major]. Students in this major will complete a minimum of ~~427~~126 hours outlined as follows.

General Education Requirements		
Requirement	Course Options	Hours
GE Launch Seminar	ACADAFF 1201	1
Foundations: Writing and Information Literacy ^a	Student Choice	3
Foundations: Mathematical & Quantitative Reasoning/Data Analysis ^a	Student Choice ^a	0-5
Foundations: Literary, Visual and Performing Arts ^a	Student Choice	3
Foundations: Historical & Cultural Studies ^a	Student Choice	3
Foundations: Natural Science ^a	Student Choice ^a	0-5
Foundations: Social & Behavioral Sciences ^a	Student Choice	3
Foundations: Race, Ethnic and Gender Diversity ^a	Student Choice	3
Theme: Citizenship for a Diverse & Just World^a	Student Choice	4
Theme: Student Choice^b	Student Choice	4
GE Reflection	Capstone**	Embedded into Major Core Capstone
Total		24-34

College / Degree Requirements ^{a, b}		
Requirement	Course Options	Hours
MATH 1151*, 1172*, (Math & Quantitative Reasoning / Data Analysis)		10
PHYSICS 1250* (Nat Sci)		5
ENGR 1181.0x, 1182.0x		4
ENGR 1100.01		1
Total		20

Major Coursework		
Course	Title	Hours
Major Core		
CBE 2100	Chemical Engineering Seminar	1
CBE 2200	Process Fundamentals	3
CBE 2345	Computational Methods for Chemical Engineering	3
CBE 2523	Separations	3
CBE 3508	Thermodynamics 1	3
CBE 3509	Thermodynamics 2	3
CBE 2420	Transport Phenomena 1	3
CBE 3421	Transport Phenomena 2	3
CBE 3422	Transport Phenomena 3	3
CBE 3610	Kinetics and Reactor Design	3
CBE 3730	Unit Operations 1	1
CBE 3731	Unit Operations 2	1
CBE 3732	Unit Operations 3	2
CBE 4760	Process Design, Econ, Strategy	3
CBE 4764**	Senior Design	3
CBE 4755	Process Safety	2
CBE 4624	Process Control	3
Total		43

Required Non-Major General Courses		
CHEM 1210	General Chemistry 1	5
CHEM 1220	General Chemistry 2	5
CHEM 2510	Organic Chemistry 1	4
CHEM 3520	Organic Chemistry 2	4
CHEM 2540	Organic Chemistry Lab 1	2
CHEM 4300	Physical Chemistry 1	3
MATH 2173	Engineering Mathematics B	3
ENGR 1221 <u>or</u> CBE 1234	Introduction to Computer Programming in MATLAB for Engineers and Scientists <u>or</u> Intro to Chemical Eng Tools	2
Total		212

Required Technical / Directed / Targeted Electives; Career Courses		
Required Elective	Math OR Stats OR CBE 5779	3
Technical Electives	CBE OR Other courses	6
Chemical Industry Technical Elective		6
Total		4218

General Education	24-34
College / Degree	20
Major Core	43
Required Non-Major	22 21
Required Technical / Directed / Targeted Electives; Career Courses	42 18
Minimum Total Credit Hours for Degree	427126

Total credits: ~~427~~ 126

Plan for implementation and informing the students of curriculum changes:

Current students will have the option to complete their current curriculum requirements (Au22 catalog year on Buckeye Degree Planner (BDP)), or begin completing the new curriculum requirements (Au26 catalog

year on BDP). The program anticipates that most currently enrolled students will opt into the new curriculum. However, in the event that a student chooses not to opt in, they will remain under the current curriculum, complete the existing 127 credit hour requirement, and fulfill the current technical elective requirement of 9 credit hours in CBE or other approved technical electives.

Listed below are the different scenarios for current students who do choose to opt-in with the new curriculum:

Scenario 1:

- Student has completed Chem 2520 or Biochem 4511 only
 - Student will have the option to complete Chem 4300 or a different CI elective

Scenario 2:

- Student has completed Chem 4300 only
 - Student will have the option to complete Chem 2520, Biochem 4511, or a different CI elective

Scenario 3:

- Student has NOT completed either Chem 2520, Biochem 4511, or Chem 4300
 - Student will have the option of completing Chem 2520 or Biochem 4511, and Chem 2520; or student will have the option to complete two CI electives of their choice

. We will initiate this new curriculum change in the autumn of 2026 and have informed Chemistry of these modifications. This will allow them to modify their course offerings as needed for next academic year. We will inform students of these new options during summer 2026 through our undergraduate advisors and an existing development course (CBE 2100 1 credit hour) that CBE students take either their 1st year (spring semester) or 2nd year (fall semester). The CBE 2100 course already discusses opportunities in various industries for chemical engineers, and we will integrate these CI technical electives as an avenue for students to explore specific areas of interest. The CBE 1234 course will be an alternative to Engr 1221 for CBE students, effective Autumn 2026. The course will first be offered in Spring 2027.. We plan on offering two sections of the course and will have the capacity to allow enrollment of all CBE students with interest in this course.