

UMBC Department of Chemical, Biochemical and Environmental Engineering

POST ABET ACTION PLAN FOR UNDERGRADUATE PROGRAM

October 11, 2019

The final statement from ABET (full document is [here](#)) regarding our last evaluation (Visit Dates: October 15-17, 2017; Accreditation Cycle Criteria: 2017-2018) was contained in a letter from ABET to Dr. Freeman Hrabowski on August 23, 2018. The entire content of the letter regarding our department is pasted below [in blue](#). Note - there are no items of “deficiency,” “weakness” or “concern” listed. However, one Program Strength was noted.

Chemical Engineering - BS Program

Introduction

The chemical engineering BS program is administered by the Department of Chemical, Biochemical, and Environmental Engineering. The program offers a traditional track and two specialized tracks: the biotechnology and bioengineering track, and the environmental engineering and sustainability track. The traditional track and the environmental engineering and sustainability track require a total of 129 credit hours; the biotechnology and bioengineering track requires 133 credit hours. Thirteen tenured or tenure-track, one adjunct (part-time), and three non-tenure-track faculty members support the program and its 338 students. Fifty-eight students graduated from the program in the 2016-17 academic year.

Program Strength

1. Students are enthusiastic participants in their education, noting personal advising by faculty as being particularly influential on their career and professional licensure efforts. This enthusiasm carries forward after graduation producing supportive alumni who promote the university and to the employers of the program's graduates.

Based on this positive assessment, no post-ABET corrective actions are required. However, the department has identified several areas where we think improvements can be made to our undergraduate program. These include...

Continuous Process Improvement

A critically important aspect of ABET accreditation is maintaining a consistent focus on educational process improvement between accreditation visits. To maintain this focus, the department will do the following.

ACTION PLAN:

- A full-time faculty member will serve as the departmental ABET Coordinator (currently Dr. Gautom Das).

- We will follow the “Yearly Timeline for Continuous Improvement” described in our “ABET Self-Study Report” submitted June 30, 2017 (section 4.B.2).
Summary of this 8 step timeline:
 1. Assessment data is collected by instructors throughout the academic year (Sept - May).
 2. This data is collected from instructors and analyzed by the ABET Coordinator (early summer).
 3. Analyzed data discussed by CBEE Undergraduate Committee (August)
 4. Recommendations for changes made to full department (fall semester).
 5. CBEE Advisory Board discusses possible changes and makes recommendations (Jan).
 6. Dept Chair, Undergraduate Program Director, ABET Coordinator and course instructors finalize solutions to be implemented (spring semester).
 7. Changes implemented throughout the next academic year.
 8. Steps 1-7 repeated every year.

Undergrad laboratory Improvements

The experiments in ENCH 437L (senior laboratory for traditional and environmental track) have not changed for a number of years. Feedback from students (advising appointments, exit interviews, faculty evaluations, ABET focus groups) agree the laboratory needs to be revamped. The data for ENCH 485L (senior laboratory for biochem/biomed track) pointed in the same direction, however in the past two years an adjunct (who is a CBEE Department alumnus) taught the course and included experiments in an industrial setting (the company where he works, DSM Nutritional Products) and those students clearly appreciated the experience.

ACTION PLAN:

- Develop a road map for revising the CBEE lab classes (by end of AY20).
- Plan will include assessment of current experiments and possibly new experiments and a timeline for purchase of improved equipment where necessary (Assuming these will be held in ILSB). Budget is \$150k over 4 years. These funds are currently held by the dept and are earmarked for lab improvement.

Increase Departmental Connection with First Year Students

The Chair and Undergraduate Program Director (UPD), with the help of the AIChE Student Chapter, held two town halls in Fall 2018 and Spring 2019. Students shared many ideas but when asked to prioritize, a top idea was to increase departmental interaction with first year students and sophomores to help them form correct expectations regarding job opportunities for those with a BS in Chemical Engineering. In addition, we believe these improved interactions will increase student retention.

ACTION PLAN:

- In academic year 2020, CBEE will hold town hall meetings with the undergrad population once each semester.
- Faculty are working with the AIChE student Chapter Executive Board who has begun to actively reach out to first year students encouraging participation in the CBEE Welcome Week event in the Fall semester. CBEE will hold a similar Departmental event in the beginning of the Spring semester.
- CBEE will use commercial-grade, text-message software and an email list to communicate with pre-Chemical Engineering students to invite them to departmental events.
- The Chair and UPD will hold coffee and/or pizza lunches open only to first-year and transfer students to provide opportunity for communication.

Increase Undergraduate Enrollment

Departmental student enrollment can be assessed by looking at enrollment in the first departmental class our students take (ENCH 215), which peaked in 2015 and has since decreased by 43%.

ACTION PLAN:

- To increase “Pre-ChemE” (i.e., freshman) applications CBEE will work to significantly revise our digital and print media and marketing materials. These will be distributed to high schools throughout MD.
- To increase our yield of enrolled to admitted students, we hypothesize increased connections between the department and accepted applicants will lead to increased engagement which will result in more enrolled students. To facilitate this increased engagement, CBEE has purchased and will use commercial-grade texting software (Textline.com) to connect with applicants. We’ll use this mode of communication to invite applicants to UMBC events and to answer questions.
- CBEE is also creating a team of “CBEE Student Ambassadors.” This group of departmental students will work with us to promote the department at recruiting events and will also send postcards to applicants seeking to build connections and answer questions.