Program Assessment Report (PAR)

Biochem + Molecular Biology (BMB) Baccalaureate Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: [AcademicYear]

I. PROGRAM LEARNING OUTCOMES

Graduates will be able to... demonstrate mastery in the content-based foundational concepts listed in the ASBMB accreditation program. communicate clearly in the sciences. move forward in their science career through acceptance into professional or graduate school, or job placement in the sciences. work successfully as a team member

II. PROCEDURES USED FOR ASSESSMENT

A. Direct Assessment

To analyze whether students demonstrate mastery in the content-based foundational concepts listed in the ASBMB accreditation program We track student grades in BMB 3850 Biochemistry Lab, BMB 4210 Biochemistry and Molecular Biology I and BMB 4230 Biochemistry and Molecular Biology II. These three courses encompass the majority of the foundational concepts suggested by ASBMB (American Society for Biochemistry and Molecular Biology) and the course grades will give a direct measure of their understanding of those concepts. We use standardized assessments given in their freshman and senior years as a part of their learner centered portfolio to evaluate content mastery. One of these assessment (Biochemistry threshold concepts) was the basis for the ASBMB concepts. We analyze student self-reporting of learning through our majors exit survey given in their senior year. To analyze if our students can communicate clearly in the sciences We track student grades in our integrated writing courses in the major (BMB 3850 Biochemistry Lab, BMB 3900 Scientific Communication and BMB 4100 Senior Reflection). We track grades on student assignments that exemplify written or oral communication. In BMB 3850 Biochemistry Lab students must generate a final written and oral presentation on the laboratory final research project. In BMB 3900 Scientific Communications students must generate a written scientific article as a final project. In BMB 4100 Senior Reflection student must rewrite an old assignment using their improved writing skills and provide a

final oral presentation of their work in the major. We track Pass/Fail grades for students in our research seminars (BMB 4000) where they must evaluate the presentation style of the invited speakers. We track the success of our Honors program students who are required to submit a final thesis and give an oral presentation We track student self-report of improved writing ability in our integrated writing courses. To analyze whether our students will be able to move forward in their science careers though acceptance into professional or graduate school or job placement We track student grades in BMB 2000 Careers in BMB as this course directly relates to finding a career, preparing the necessary documents and listening to various presenters on their chosen career paths. We track student grades in BMB 4100 Senior Reflection as a portion of this course is dedicated to polishing their career documents and assisting in job or school applications. We track student placement into graduate/professional schools and in the job market. To analyze whether students can work successfully as a team member We track students throughout our courses as they work in small groups, as lab partners and generally as a member of a team. Any interventions that are needed with our students to assist in their teamwork is logged.

B. Scoring of Student Work

For the majority of the assessment data it was scored by the professor instructing the course. Exams, papers and presentations are all examples of items that were assessed. For presentations and papers rubrics are used to evaluate student success and provide feedback. Exams format can vary over the courswork as so there is no standard for these. Some standardized assessment are used as a tool to observe student content mastery. While these are scored by the program director, the answer keys and questions were generated by a third party and only verified by the program director.

C. Indirect Assessment

Students are given an exit interview in their senior year as an evaluation of the program and its courses. Observations are made of students and their relationships with one another in small group activities and lab settings. An alumni survey will be generated to further evaluate the program several years out from graduation (we do not yet have students more than 1 year out.)

III. ASSESSMENT RESULTS/INFORMATION:

1. To measure our majors content mastery of foundational concepts in BMB A. We have reviewed their grades in BMB 3850, 4210 and 4230. B. We have reviewed student scores on the IMCA and Biochem assessments C. We evaluated students self reporting of learning in our courses on our exit interview 2. To measure our majors communication in the sciences A. We analyze their writing grades in BMB

3850 B. We analyze the final project grade in BMB 3900 C. We analyze grades of final projects and writing assignments in BMB 4100 D. We analyze grades in BMB 4000 E. We analyze our honors students' ability to communicate orally and in written form as a part of graduating with honors. F. We analyze the exit survey to see if students felt their writing improved in our integrated writing courses in the major. 3. To measure our majors ability to move forward in their science career A. We view pass rates in BMB 2000 Career in BMB B. We view pass rates of BMB 4100 C. We analyze employment/school acceptance rates of our graduates. 4. To measure our majors abilities to work as a team member A. We reviewed teamwork intervention events over BMB 2100, 3850, 4210 and 4230

1A In BMB 3850 of 12 majors, all passed with 1 B and 11 As In BMB 4210 of 14 majors, all passed with 2Cs, 5Bs and 7 As In BMB 4230 of 15 majors, all passed with 7 Bs, and 8 As including two students who did not pass in 2019 1B Of 9 students we saw an average increase of 18% on the Biochem assessment and 23% on the IMCA. This is higher than last year as expected since these student had accurate base scores in their freshman year. 1C All student indicated that they learned in all of our content based courses. The value below indicates average agreement with learning 0 is no learning, 5 is learning BMB 2100 = 4.8 BMB 3850 = 4.6 BMB 4210 = 4.8 BMB 4230 = 4.6 2A Of the 12 majors in the course all received an A on the final oral presentation Of the 12 majors in the course 11 received an A on their final written paper, and 1 received a D. 2B Of the 11 majors in the course all received an A. 2C Of the 9 majors in the course all received passing grades with 6 As, 2Bs and 1 C. 2D Of the 9 students in the course in Fall 2019 all passed Of the 7 students in the course in Spring 2020 all passed 2E One honors student graduated 2F Of the 9 students, all felt their writing had improved in BMB 3850, BMB 3900 and BMB 4100 (our integrated writing courses). The value below indicates average agreement with learning 0 is no learning, 5 is learning BMB 3850 = 4.5 BMB 3900 = 4.75 BMB 4100 = 4.0 3A Of the 15 students in the course 13 passed with an A while 2 passed with a B 3B Of the 9 majors in the course, 8 passed with an A and 1 with a B 3C Of the 4 which graduated in the previous year, all are working towards their final careers goals. 1 is taking a gap year prior to medical school, one is working in a lab on campus and two were accepted into PhD programs. 4A There were no recorded interventions for the year

We feel that we can demonstrate ample learning of the major foundational concept areas in Biochemistry and Molecular biology based on student grades, standardized assessment scores and their own self evaluations. We feel that students display scientific communication through the various written and oral projects that are incorporated into our integrated writing courses. Additionally, students were given the opportunity to view firsthand how professionals communicate in both the oral and written format. Moreover, our honors program emphasize the importance of communicating scientific work. Finally, student self-report that they feel like their writing has improved. We feel that our students are able to move forward in their science careers as they are prepared to do so throughout the major. Our job/school placement is

currently 100%, though we have only just started as a program. We feel that students are given ample opportunity to develop and work as a team member throughout the program including in a lab setting. As no interventions were needed this year, students are performing satisfactorily.

IV. ACTIONS TO IMPROVE STUDENT LEARNING

This information was shared with the Undergraduate Oversight Commitee which consists of the department chair and both Vice chairs in the department. Any suggestions for modification are taken to the Departmental Curriculum committee for evaluation. Detailed proposed changes are taken to the departmental faculty meetings for discussion. Thus far the current assessmet findings are not problematic and we have only had two graduating classes. That being said we are adding a retention portion to our program assessment in furture years. Currently we are expanding our freshman courses from 0.5 credits to 1 credit to increase contact with students in their freshman year

V. SUPPORTING DOCUMENTS

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.