

SPECIAL REPORT

OF THE

**ACADEMIC MATTERS, ACADEMIC PRIORITIES AND
PROGRAM AND BUDGET COUNCILS**

concerning the

**ESTABLISHMENT OF CONTINUATION REQUIREMENTS
FOR THE MAJOR IN BIOCHEMISTRY AND MOLECULAR BIOLOGY**

Presented at the
769th Regular Meeting of the Faculty Senate
May 4, 2017

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ACADEMIC MATTERS COUNCIL

The Department of Biochemistry and Molecular Biology (BMB) is proposing to establish a continuation requirement for its BS program. The requirement is a cumulative GPA of 2.5 or higher in foundational courses in Math and Chemistry, obtained by the end of the third semester in the major. The proposal presents data indicating that students who do not satisfy the requirement have a significantly lower graduation rate in the major and take longer to graduate than BMB majors as a whole. The proposed requirement is intended to enhance student success by clearly indicating to incoming students what is needed for success in the major; by providing an incentive for students who are having difficulty with the requirement to meet with and receive early guidance from advisors; and, if necessary, by helping students choose a more appropriate major before they have spent a long time repeating courses and not making progress toward the degree. The proposal notes that the department is undertaking several initiatives to ensure that the continuation requirement does not have the effect of inadvertently reducing the number of underrepresented minority, first-generation college, and low-income students in the major.

At its meeting on April 12, 2017, the Academic Matters Council voted unanimously to recommend Faculty Senate approval of the proposal. It was submitted as Proposal #3377 in the Course and Curriculum Management System.

ACADEMIC PRIORITIES COUNCIL

On February 24, 2017, the Academic Priorities Council endorsed approval of this proposal.

PROGRAM AND BUDGET COUNCIL

This revision proposes a Continuation Policy to assure the timely completion of the Biochemistry and Molecular Biology major. The result of the change is expected to be higher rates of retention and academic success. It sets minimum progress requirements and establishes a framework that promotes intervention with students who are not making adequate progress in the major.

At its meeting on February 15, 2017, the Program and Budget Council unanimously approved the Establishment of Continuation Requirements for the Major in Biochemistry and Molecular Biology, submitted as Proposal #3377 in the Course and Curriculum Management System.

MOTION: That the Faculty Senate approve the Establishment of Continuation Requirements for the Major in Biochemistry and Molecular Biology, as presented in Sen. Doc. No. 17-076.

Briefly describe the proposal.

Proposed Continuation Policy for Biochemistry and Molecular Biology majors:

The proposal:

We are proposing a Continuation Policy to assure the timely completion of the Biochemistry and Molecular Biology major. Students in the Biochemistry and Molecular Biology major must fulfill the following criteria to remain in the major:

- a) **A cumulative GPA of 2.50 or higher in the courses listed below:**
 - 1. **Math 127 - Calculus I or an equivalent course**
 - 2. **Math 128 - Calculus II or an equivalent course**
 - 3. **Chemistry 111 - General Chemistry I or an equivalent course**
 - 4. **Chemistry 112 - General Chemistry II or an equivalent course**
- b) **The grades in these courses must be achieved by the end of the third semester as a Biochemistry and Molecular Biology major.**
- c) **A student may not repeat more than two courses required for the major in the first 3 semesters as a Biochemistry and Molecular Biology major.**

The justification for these criteria is that students who do not meet these performance-based goals in the above courses often have to repeat several courses which slows their academic progress and delays their graduation. Students who do not complete the above courses with a cumulative GPA of 2.50 or greater in the first three semesters in the major will be discontinued from the Biochemistry and Molecular Biology major and advised to transfer into another undergraduate major on campus. Any student who was discontinued from the major, but later improves his/her performance, can petition to return into the major. This requirement applies to both internal and external transfer students. Only courses taken through UMass are applicable to the grade requirement for this policy. Transfer courses and Advanced Placement (AP) courses are counted only for credit.

Rationale:

The Biochemistry and Molecular Biology major includes a rigorous program of courses in science and math (a list of requirements for the major is available in attached document). As such, foundational courses such as introductory chemistry and calculus are strong predictors of future performance in the major. Setting these minimum requirements will establish a framework that promotes intervention with students who are not making adequate progress in the major. Students who receive multiple C or lower grades in the above foundational courses historically have had to repeat several courses to complete the major, and are overall less likely to complete the major. Thus, their inability to attain the above minimum performance standards slows their academic progress and delays their graduation. This conclusion is supported by data from our students over the past two years and also predictive data about our students (2000-2009) from the Education Advisory Board (EAB) platform of the UMass Amherst Student Success Collaborative, which show that low grades in these foundational courses are associated with low graduation rates and delayed graduation (Tables 1,2,3).

Table 1: Length of time to graduate

BMB Students receiving ... Average time to graduation (semesters) % 4-Year graduation

C or lower in Chem 111 or Chem 112 10.1 29

C or lower in Math 127 or Math 128 9.5 42

Comparison: Overall BMB majors N/A 85

Table 2:

Of BMB Students who received C or lower in one of the courses listed in Table 1

- 74 % had a C or lower in another required course in the major
- These students (C or lower in more than one required course) took, on average, 1 semester longer to graduate than those with only one C or lower grade.

Table 3: Graduation rate in BMB major

BMB Students who received ... Graduation rate as BMB major (EAB data)

C or lower in Chem 111 38 %

C or lower in Chem 112 46 %

C or lower in Math 127 34 %

C or lower in Math 128 40 %

GPA of 2.50 or lower in first 2 semesters 12 %

GPA of 2.50 or lower in 3rd and 4th semesters 16 %

Furthermore, 75% of Biochemistry and Molecular Biology majors currently listed as “high risk” in the EAB platform did not meet the Continuation Policy minimum requirements and likely would have benefitted from more pro-active advising early in their undergraduate careers (the remaining 25% are students whose performance declined following their third semester).

Proposal’s purpose and the particular knowledge and skills to be acquired:

The Biochemistry and Molecular Biology major requires mastery of several quantitative skills and scientific principles). We are requesting that this Continuation Policy in order to define the criteria that correlate with success in the major. We expect this policy to promote more substantive advising conversations with our students about strategies for achieving the grades required for academic success, and thus increase the likelihood that students in the major will meet these performance criteria. The Continuation Policy provides leverage for Biochemistry and Molecular Biology faculty and advisors to offer guidance to students whose performance is not predictive of timely completion of the major requirements, and may motivate students who are at risk of being discontinued from the major to get help and develop good study skills early on. The proposed policy gives students an indication of the rigors of the Biochemistry and Molecular Biology major before they have made a long-term commitment to this program, and discourages students from merely repeating multiple courses without seeking advice. We can assist such students in deciding on a course of action that may include utilizing the University Repeat Course Policy or seeking a more appropriate major early in their undergraduate careers, increasing the likelihood that these students will achieve academic success in a timely manner.

The Continuation Policy is designed to specify standards for academic success in the Biochemistry and Molecular Biology foundational courses.

We expect that the result of this Continuation Policy will be higher rates of retention and academic success among Biochemistry and Molecular Biology majors as they progress toward the BS in Biochemistry and Molecular Biology. Our advising staff is already using tracking tools in SPIRE and the EAB platform to monitor student performance and so will be able to identify students who are not meeting these performance-based criteria, and use these criteria to address their progress in a timely fashion. We keep records of

contacts with students through the notes systems in SPIRE and EAB. We have already been working with the College of Natural Sciences Advising Office and will, when appropriate, refer students to this office for further guidance. The EAB platform allows us to monitor any at-risk students using its Watch List tool. In addition to monitoring the success of students who stay in the major, this tool has the further advantage that we can continue to track students that leave the major so we can collect statistics on the programs into which these students transfer, their graduation rates and time-to-graduation.

Overview of the process for developing the Proposal

The Departmental Academic Affairs Committee of Biochemistry and Molecular Biology, with consultation of advising staff and faculty members teaching major courses, contributed to the development of this proposal. We also consulted advising staff in Kinesiology about their Continuation Policy and Advising Office in the College of Natural Sciences.

Potential Impact on Broadened Participation

We are fully aware that students who are traditionally underrepresented in STEM have difficulty succeeding in our major compared to their peers. With this in mind, we are working on several focused initiatives that will engage all students, with some focus on our most vulnerable students, and provide early academic intervention as needed. This includes assigning peer mentors to all incoming Biochemistry and Molecular Biology majors, a mandatory seminar for incoming majors, and developing an Early Alert program for students in our gateway Biochemistry course so we can help struggling students improve performance mid-semester. These proactive, intensive support measures will help ensure that this policy will not inadvertently produce an effect that would reduce the numbers of underrepresented minority, first-generation college, and low-income students who pursue (and succeed in) Biochemistry and Molecular Biology. We will work in conjunction with the activities in College of Natural Sciences Advising Office to accomplish this goal.

Academic Requirements Review

Requirement: V. In addition to the Gen Ed, Diversity, and College requirements, you must complete the following Major requirements: (rg187)

Rule: Biochemistry plan requirements

Line: **No pass/fails in major**

Recall: CAT

Recall: USE

Line: 1. Take first level Calculus. (r11883,ln20)

Line: 2. Take second level calculus. (r11883,ln30)

Line: 3. Take Math 233, Res-Econ 212, or Statistics 240 or 501. (r11883,ln40)

Line: 4. Take Physics 131, 151 or 181. (r11883,ln50)

Line: 5. If you took the 3-unit Physics 131, 151 or 181 lecture, you must also take the Physics 133, 153 or 183 lab. (r11883,ln55)

Line: 6. Take Physics 132, 152 or 182. (r11883,ln60)

Line: 7. If you took the 3-unit Physics 132, 152 or 182, you must also take Physics 134, 154 or 184. (r11883,ln70)

Line: 8. Take Chemistry 111 or 121. (r11883,ln80)

Line: 9. Take Chemistry 112 or 122. (r11883,ln90)

Line: 10. Take Chemistry 261 or 265. (r11883,ln100)

Line: 11. Take Chemistry 262 or 266. (r11883,ln110)

Line: 12a. Take Chemistry 267 and 268, OR (r11883,ln116)

Line: 12b. Take Chemistry 263 and 264, OR (r11883,ln117)

Line: 12c. Take Chemistry 269. (r11883,ln118)

Line: 13. Introductory Biochemistry Lab. (r11883,ln120)

Line: 14a. Take Physical Chemistry, OR (r11883,ln130)

Line: 14b. Take Physical Chemistry 475 and 476. (r11883,ln140)

Line: 15. Take Biology 151 or 190H. (r11883,ln150)

Line: 16a. Take Biology 101. (r11883,ln155)

Line: 16a. Take Biology 152 and 153. (r11883,ln160)

Line: 16b. Take Biology 197FH and 197GH. (r11883,ln165)

Line: 17. Take Biology 283 or Animal Sci 311. (r11883,ln170)

Line: 18. Take Biochemistry 285 or 275. (r11883,ln180)

Line: 19. Take Biochemistry 523. (r11883,ln190)

Line: 20. Take Biochem 524. (r11883,ln200)

Line: 21. Take Biochem 526. (r11883,ln210)

Line: 22. Take Junior Year Writing, Biochem 491H. (r11883,ln220)

Line: 23. Advanced electives: Take eight units of courses at or above the 300-level in Biochemistry, Biology, Chemistry, Mathematics, Microbiology, or Veterinary and Animal Science. Psych 330 and 335 also count. Biochem 394RI, 398, 398A, 420, 421, 498, 498A, 523, 524 and 590A do not count, (r11883,ln240)

Rule: Additional Advanced Electives

Line: **Advanced Electives Not Applied to Major Requirements**

Recall: GUS

Recall: GUS

Recall: GUS

Recall: GUS

Rule: **Additional Biochemistry Courses (r10235)

Line: Other Courses

Recall: USD

Recall: ITC

Rule: ***Courses Not used for Degree/Major/Minor Requirements*** (r10237)

Recall: PAS

Recall: USD

Recall: ITC

Requirement: You must complete the following departmental honors.

Rule: Departmental Honors Requirements

Line: 1. Take one BioChm honors 300-level or higher (e.g., BioChm 396H or 496H for 3 credits). (r12015,ln10)

Line: 2. Take one BioChm honors course at any level (e.g., BioChm 285 or 275 with honors colloq). (r12015,ln20)

Line: 3. Take BioChm 491H or NatSci 289H. (r12015,ln30)

Line: 4. Take BioChm 499Y and 499T. (r12015,ln40)

Attach any supporting documents.

Biochemistry and Molecular Biology

BMB Major Requirements: Fall, 2016

General information on the BMB Major: The BMB curriculum is an exciting, rigorous and extremely rewarding course of study that prepares undergraduates for employment in a wide range of scientific, technical, and educational fields. These include positions with university, government and medical laboratories, positions related to science policy, patent law, biotechnology companies, food industries, clinical laboratories and scientific equipment suppliers, to name a few. BMB graduates are well positioned to undertake Masters (MS) and PhD graduate work in areas such as agricultural biotechnology, genomics, molecular genetics, immunology, pharmacology, virology, physiology, and nutrition. Many BMB graduates go on to medical school, dental school, pharmacy school, physician's assistant programs and advanced training in many other healthcare professions.

BMB Advising: The Academic Advisor for the department is Valerie Miller; she is available for general questions at bmbadvising@biochem.umass.edu. The Undergrad Program Office is in 912 Lederle Tower (LGRT), phone 545-0352. The Chief Undergraduate Advisor, Amy Springer, can be contacted at ChiefAdvisor@biochem.umass.edu.

Be sure to read all e-mail from ____@biochem.umass.edu; much helpful and time-sensitive information will be provided this way.

The BMB department places a Registration Hold on your account each semester. You are required to clear your course selections with BMB before each Registration period in order to have your Registration Hold removed.

There are three ways to have your Registration Hold lifted, and you will receive email reminders that prompt you to 1) attend a group advising session, 2) clear your courses electronically, or 3) meet with BMB Academic Advisor Valerie Miller.

After your Registration Hold is lifted you should register for courses as soon as your Registration Appointment starts. (This is indicated on your Student Center page in SPIRE). Following is some general advice that is relevant every semester:

Each semester, 12 graded credits are required to maintain full time student status (important for financial aid, campus housing, health insurance).

BMB can only override you into BIOCHEM courses (and only with permission from the course instructor). We cannot override you into courses offered by BIO, CHEM, MATH, PHYSICS, etc., nor can we waive another department's prerequisites. For more facts/tips also see the FAQs tab on the Undergraduate page of the BMB website at www.umass.edu/biochem.

Registration is ongoing from the start of the Registration period though Add/Drop; your fellow students are adding and dropping courses continuously. The best strategy for getting into some courses is to watch the enrollment counts on Spire. We urge you NOT to use the Drop function in SPIRE—instead use SWAP. If you drop a section that is at an inconvenient time, in order to sign up for another time, you run the risk of getting neither.

Some courses, especially those with lab sections, fill up quickly. Some departments wait to see what the demand is in any given semester and then open up more sections later in the registration period. Some departments restrict courses to their majors for a period of time and then open up seats to non-majors.

The following notes are keyed [1], [2] etc. to the courses as numbered in the BMB Major Course Requirements Chart at the end of this document. Many courses have class requisites and course prerequisites; it is up to the student to determine these and satisfy them. Note that BMB majors must achieve a grade of C- or above for BIOCHEM courses in order for these courses to satisfy requirements for the BMB major.

BMB First year (Freshman):

[1] Introductory Biology:

Bio 151, Bio 152, Bio 153; BMB majors must earn a grade of C or better in all 3 courses.

- Bio 151, 152 and 153 cannot be replaced by advanced placement (AP) Biology credits and are not waived by the BMB department.
- Bio 153 can be taken concurrent with or after Bio 152.
- BIOTAP members take Bio 190H, 197FH, and 197GH.

[2] General Chemistry:

Chem 111 and 112 with lab (4 cr. each) require Math Placement Test score of 20 or above on Part A; Commonwealth Honors College (CHC) students take Chem 121H and 122H. Grade of C- must be earned in these courses.

- Chem AP score of 4 or 5 is accepted as Chem 111 only.

[3] Math options (BMB requires 3 semesters of math):

- Calc I
 - Math 127, requires Math Placement Test score of 20 or above on Part A; OR
 - Math 131, requires Math Placement Test score of 23 or above on Part A and 5 or above on Part B.
- Calc II (Math 128 or 132)
- 3rd Math/Stat, see note [9]:
 - Calc III (Math 233, pre-req: Math 131 and 132; or Calculus AP credit); OR
 - One Statistics course: Approved statistics courses include Stats 501 (restricted to Junior and Senior students), Stats 240, Psych 240 (Psych majors only), and ResEcon 212 by permission of BMB Academic Advisor.
 - Or Statistics Advanced Placement score of 4 or 5.

[4] College Writing: EnglWrit 112 College Writing is required for all first year students; EnglWrit 112H should be taken by CHC students. The Writing Program Office is in 305 Bartlett Hall, phone 545-0610. A combined SAT Critical Reading and Writing score of 1460 exempts students from the English Writing Requirement, as does a 4 or 5 AP score in English Language and Composition.

[5] General Education (Gen Ed) Course Requirements:

- BMB majors get credit for 4 Gen Ed requirements for math and science courses taken for the BMB major. BMB majors must additionally take at least 5 Gen Ed courses (19 cr.). Of the total, 2 courses must have a U or G Gen Ed designation.
- BMB students should periodically check their Academic Requirements Report (ARR) in SPIRE for their progress on Gen Ed course requirements. The University determines this, not the individual departments. Students should direct all Gen Ed questions to the Records Office, 213 Whitmore; or see <http://www.umass.edu/gened/>.

BMB Second year (Sophomore):

[6] BMB Cellular and Molecular Biology (offered Fall and Spring):

Biochem 275 (Biology 285 cannot be substituted). This is the first BIOCHEM course that BMB majors take and should be taken in the fall semester. Transfer students can take this course in the spring semester and stay on track for timely graduation.

- A Grade of B- or better in Biochem 275 is required to continue in the BMB major.

- Prerequisites: Bio 151 (with a grade of C or better) AND Chem 111 (or 121H) AND Chem 112 (or 122H) (with a grade of C- or better in both).
- Biochem 291H is a 1-credit seminar required for BMB majors who are CHC students; non-CHC BMB majors are encouraged to take the course and are accommodated as space permits.

[7] BMB Introductory Biochemistry Lab (offered Fall and Spring):

Biochem 276, prerequisite: Biochem 275 with a grade of B- or better.

[8] Organic Chemistry:

Chem 261 Prerequisite: CHEM 112 or CHEM 122H with a grade of C- or better. Chem 262 Prerequisite: CHEM 261 or CHEM 265 with a grade of C- or better. Chem 269 Prerequisite: CHEM 261 or CHEM 265.

- Chem 269 can be taken either concurrent with Chem 262 or in a subsequent semester. Students can take Chem 265, Chem 266, Chem 267 and Chem 268 with permission from the Chemistry Department.

[9] Third semester of Math:

- Calc III (Math 233) (pre-req: Math 131 and 132, or Calculus AP credit); OR
- One Statistics course (can be satisfied with Statistics AP score of 4, or 5); approved statistics courses include:
 - Stats 240
 - Stats 501 (restricted to Juniors and Seniors)
 - Psych 240 (if double major or minor in Psych)
 - ResEcon 212 (with prior permission from BMB Academic Advisor)

[10] Physics I and II:

- Introductory Physics: Physics 131, Physics 132, 4 cr. each; OR
- General Physics: Physics 151, (with lab; co-requisite, Math 131), Physics 152 (with lab; prerequisites Physics 151, co-requisite Math 132) 4 cr. each; OR
- Physics 181 Mechanics, Physics 182; Electricity and Magnetism (consent of instructor for non-Physics majors), 4 cr. each.

Physics requirement can be covered by Advanced Placement. Scores of 3,4, or 5 in Physics 1 satisfies Physics 131, and 3,4, or 5 in Physics 2 satisfies Physics 132. Scores of 4 or 5 in Physics C – Mechanics gives credit for Physics 151; scores of 4 or 5 in Physics C-Elec&Mag gives credit for Physics 152. .

BMB Third year (Junior):

Biochemistry core: A grade of B- or better in Biochem 275 is required to take these courses, and additional prerequisites are indicated below.

[11] Structure and Function of Biomolecules: Biochem 523 (offered Fall only), Prerequisite: Chem 261 and 262; or 265, 266, 267, and 268.

[12] Advanced Cell and Molecular Biology: Biochem 524 (offered Spring only), Prerequisite: Biochem 523

[13] Advanced Biochemistry Lab: General Biochemistry Lab for Majors, Biochem 526; Course satisfies Part I of the Junior Year Writing Requirement in BMB; Prerequisite: Biochem 276.

[14] Integrative Experience: Biochem 394RI, Real World Biochemistry and Molecular Biology (Fall only). NatSci 494I (Spring only) satisfies this requirement. Other departments' IE courses may be taken to satisfy this requirement only with prior approval from BMB Academic Advisor Valerie Miller. (iCons[©] students satisfy the IE and the Scientific Writing Part 2 with different courses so should not take Biochem 394RI or NatSci 494I.)

Additional courses required of BMB majors:

[15] Introduction to Genetics: Biochem 390G, or Bio 283 (Micro 330 or AnSci 311 can be substituted if necessary and, if so, cannot be counted towards required Advanced Elective credits).

[16] Physical Chemistry: Biochem 471; Prerequisites: (Chem 112, or 122H), AND (Physics 132, 152 or 182), AND (Math128 or 132) all with a grade of C- or better.

BMB Fourth Year (Senior):

[17] Scientific Writing Requirement (2nd part)

Biochem 491H satisfies Scientific Writing Part II; Prerequisites: Biochem 523, 524 or 526. For iCons[©], see note under [14].

[18] Advanced Elective Course Requirements: minimum total of 8 credits

- Math and Science courses numbered 300 and above, or other courses as approved by the BMB Academic Advisor Valerie Miller. Courses required for the BMB major, including Biochem 491H and Biochem 471, and courses intended for non-BMB majors, such as Biochem 420 and 421, do not count toward advanced elective requirement. See Advanced Elective Course Options on the BMB website, Undergrad page, for examples and further information; or speak with BMB Academic Advisor Valerie Miller.
- Independent Study/Research credits (e.g., Biochem 396, 396H, 496, 499Y or 499T).
- Note: Practica, including Biology 398 or Biochem 498, do NOT count as advanced elective credits.

[19] BMB Thesis Research

Honors research and thesis projects (Biochem 499Y and 499T), for CHC students and for Departmental Honors.

Total credits: UMass Amherst requires a minimum total of 120 credits for graduation.

(Please refer to Proposal #3377 in the Course and Curriculum Management System for the BMB Major Course Requirements Chart)

***Proposed Continuation Policy for Biochemistry and Molecular Biology majors:
Submitted 10/3/16***

The proposal:

We are proposing a Continuation Policy to assure the timely completion of the Biochemistry and Molecular Biology major. Students in the Biochemistry and Molecular Biology major must fulfill the following criteria to remain in the major:

a) A cumulative GPA of 2.50 or higher in the courses listed below:

1. *Math 127 - Calculus I or an equivalent course*
2. *Math 128 - Calculus II or an equivalent course*
3. *Chemistry 111 - General Chemistry I or an equivalent course*
4. *Chemistry 112 - General Chemistry II or an equivalent course*

b) The grades in these courses must be achieved by the end of the third semester as a Biochemistry and Molecular Biology major.

c) A student may not repeat more than two courses required for the major in the first 3 semesters as a Biochemistry and Molecular Biology major.

The justification for these criteria is that students who do not meet these performance-based goals in the above courses often have to repeat several courses which slows their academic progress and delays their graduation. Students who do not complete the above courses with a cumulative GPA of 2.50 or greater in the first three semesters in the major will be discontinued from the Biochemistry and Molecular Biology major and advised to transfer into another undergraduate major on campus. Any student who was discontinued from the major, but later improves his/her performance, can petition to return into the major. This requirement applies to both internal and external transfer students. Only courses taken through UMass are applicable to the grade requirement for this policy. Transfer courses and Advanced Placement (AP) courses are counted only for credit.

Rationale:

The Biochemistry and Molecular Biology major includes a rigorous program of courses in science and math (a list of requirements for the major is available in attached document). As such, foundational courses such as introductory chemistry and calculus are strong predictors of future performance in the major. Setting these minimum requirements will establish a framework that promotes intervention with students who are not making adequate progress in the major. Students who receive multiple C or lower grades in the above foundational courses historically have had to repeat several courses to complete the major, and are overall less likely to complete the major. Thus, their inability to attain the above minimum performance standards slows their academic progress and delays their graduation. This conclusion is supported by data from our students over the past two years and also predictive data about our students (2000-2009) from the Education Advisory Board (EAB) platform of the UMass Amherst Student Success Collaborative, which show that low grades in these foundational courses are associated with low graduation rates and delayed graduation (Tables 1, 2, 3).

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C or lower in Chem 111 or Chem 112	10.1	29
C or lower in Math 127 or Math 128	9.5	42
Comparison: Overall BMB majors	N/A	85

Table 2: Of BMB Students who received C or lower in one of the courses listed in Table 1
<ul style="list-style-type: none"> • <u>74 %</u> had a C or lower in <u>another</u> required course in the major • These students (C or lower in <u>more than one</u> required course) took, on average, <u>1 semester longer</u> to graduate than those with only one C or lower grade.

Table 3: Graduation rate in BMB major	
BMB Students who received ...	Graduation rate as BMB major (EAB data)
C or lower in Chem 111	38 %
C or lower in Chem 112	46 %
C or lower in Math 127	34 %
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GPA of 2.50 or lower in first 2 semesters	12 %
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Furthermore, 75% of Biochemistry and Molecular Biology majors currently listed as “high risk” in the EAB platform did not meet the Continuation Policy minimum requirements and likely would have benefitted from more pro-active advising early in their undergraduate careers (the remaining 25% are students whose performance declined following their third semester).

Proposal's purpose and the particular knowledge and skills to be acquired:

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We are fully aware that students who are traditionally underrepresented in STEM have difficulty succeeding in our major compared to their peers. With this in mind, we are working on several focused initiatives that will engage all students, with some focus on our most vulnerable students, and provide

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early academic intervention as needed. This includes assigning peer mentors to all incoming Biochemistry and Molecular Biology majors, a mandatory seminar for incoming majors, and developing an Early Alert program for students in our gateway Biochemistry course so we can help struggling students improve performance mid-semester. These proactive, intensive support measures will help ensure that this policy will not inadvertently produce an effect that would reduce the numbers of underrepresented minority, first-generation college, and low-income students who pursue (and succeed in) Biochemistry and Molecular Biology. We will work in conjunction with the activities in College of Natural Sciences Advising Office to accomplish this goal.