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MEMORANDUM

ATTENTION Senate **DATE** April 27, 2023
FROM Kevin Oldknow, Senior Advisor on Academic Planning and Acting Chair, SCUP on behalf of Wade Parkhouse, Provost and Vice-President Academic **PAGES** 1/31
RE: External Review Mid-Cycle Report for the Department of Molecular Biology and Biochemistry (SCUP 23-24)



At its meeting on April 12, 2023, SCUP reviewed the External Review Mid-Cycle Report for the Department of Molecular Biology and Biochemistry which resulted from its March 2019 External Review.

The following documents are attached for the information of Senate:

- Update on the Action Plan
- Assessment of Educational Goals
- SCUTL's feedback on the assessment of Educational Goals



FACULTY
OF SCIENCE

DEPARTMENT OF MOLECULAR
BIOLOGY AND BIOCHEMISTRY

Lisa Craig, Professor & Chair

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MEMORANDUM -----

ATTENTION Kevin Oldknow, Senior Advisor, Academic Planning

Re. Mid-Cycle Report

DATE Jan. 20, 2023

Please find attached the completed Mid-Cycle Report for the Department of Molecular Biology and Biochemistry including the Assessment of Educational Goals.

Cc: Edward Tjiong, Chair's Secretary/Financial Assistant, Molecular Biology & Biochemistry

External Review Mid-Cycle Report for the Department of Molecular Biology and Biochemistry

Action	Progress Made
1. Programming 1.1 Action to be taken	
1.1.1 Undergraduate Program	
<p>A) MBB will review the content of its biochemistry courses to ensure sufficient Enzymology content and include additional lecture material in relevant courses if necessary.</p>	<p>The MBB Departmental Undergraduate Curriculum Committee (DUCC) Chair has established committee comprised of instructors for all MBB courses with enzymology content (MBB 222, 321, 324 and 423). The committee will review this content and discuss where to introduce more advanced enzymology content, likely in MBB 324 and/or 423.</p>
<p>B) As previously done several years ago, MBB will undertake a comprehensive review of its fourth year courses to ensure that they align with the program goals and provide both breadth and depth without duplication of content. This review will be overseen by the Departmental Undergraduate Curriculum Committee.</p>	<p>MBB has made changes to its upper division curriculum, partly to address the External Review Recommendations and partly to introduce a new <u>Concentration in Infection & Immunology</u>. We added 4 new 400-level/graduate courses to its curriculum: Cancer Immunology, Advanced Microbial Pathogenesis, Stem Cells and Molecular Epidemiology of Infectious Diseases. Further review of 400-level courses is in progress, with sub-committees evaluating blocks of related courses.</p>
<p>C) MBB will develop a second year lab course designed to introduce students to basic laboratory skills in molecular biology and biochemistry. This course will align with the content of MBB 222 and provide practical experience for second year students applying for Co-op positions and summer research opportunities. This will also necessitate the concomitant removal of a second</p>	<p>MBB has put considerable effort into developing a second year lab course, revising its 300-level laboratory courses accordingly and modifying the lower division curriculum to accommodate this new course. We developed <u>MBB 229-2 (Introductory Molecular Biology & Biochemistry Laboratory)</u>, which provides hands-on experiential learning in foundational MBB methods. MBB 229 will become a required course for MBB Majors/Honours student, to be taken in their second year, at the same time that the theory of these methods is covered in lecture-based courses (MBB 222, 231). MBB 308 (Molecular Biology Laboratory) and 309 (Biochemistry Laboratory) have been revised, removing overlap with MBB 229 and introducing new materials such as CRISPR/Cas. To make room for MBB 229 we removed one 3-unit course from the Lower</p>

<p>year course to create room in the program. MBB will consult with the Faculty of Health Science in addition to relevant departments within the Faculty of Science in the development of the second year lab course.</p>	<p>Division curriculum (either a second PHYS or MATH or an additional CHEM, Senate approval is pending). Our plan was to offer MBB 229 (and our advanced laboratory course, MBB 432) in one of our two teaching labs and to offer 308 and 309 in the other. This would require the purchase of ~\$350,000 in equipment and supplies for the 229 teaching lab. Unfortunately we have been told by both the Faculty of Science and the VPA that there is no funding available and our efforts to fund-raise with assistance from the FoS have been unsuccessful, delaying our ability to introduce this important course. We now plan to introduce MBB 229 in Summer 2023, but will need to alternate classes between the two teaching labs to utilize existing equipment because neither lab individually has all the equipment necessary for every experiment in the MBB 229 curriculum. This is not ideal as the students will need to come to different teaching labs for different experiments, and our enrolment capacity will be limited, meaning that this course will not be open to Biology, Chemistry, BPK and FHS students, as originally planned. We will need to purchase at least some new equipment as the labs will be at full capacity. We will also require funding for a 0.5 Teaching Technician, another Instructor and Teaching Assistants. MBB 229 will be offered 3 semesters per year.</p>
<p>D) To increase summer course offerings, MBB will offer MBB 321 (Intermediary Metabolism) in the summer semester.</p>	<p>We have satisfied the demand for MBB 321 by offering it 5 out of 6 semesters. MBB 321 is now offered in Fall and Spring and alternating Summers.</p>
<p>E) MBB will work with the Faculty of Science to upgrade the computer infrastructure necessary for teaching bioinformatics and genomics courses.</p>	<p>We secured special VPN access for students our two bioinformatics/data analysis courses (MBB 243 and MBB 342), which simplifies greatly the students access to the server for computational labs. (Before Fall 2022 only undergraduate students in Computing Science were given VPN access). A new high-memory Linux server has been purchased to replace the old server and is now installed in the SSB where it is maintained by the MBB IT support staff. This host is now used by the bioinformatics lab components of MBB 243 and 342 and can be accessed remotely by instructors and students over VPN. Workstations in the teaching lab have some performance issues and are 5-6 years old and should be replaced at a cost of \$36K based on a recent quote.</p>
<p>F) MBB will develop and implement strategies to better inform undergraduate students about research</p>	<p>MBB has developed a Research Opportunities website that describes all opportunities: Directed Research courses, NSERC USRAs, VPR Awards, Co-Op, volunteering and work study. Students can find MBB faculty who have undergraduate research opportunities at http://www.sfu.ca/mbb/undergrad/current-students/research.html.</p>

opportunities (volunteer, Directed Studies, NSERC USRAs, Co-op etc.)	
G) MBB will work toward developing/enhancing career planning for undergraduate students by providing career information on the MBB website and develop additional strategies to educate students about potential job opportunities.	MBB now has a Careers in MBB webpage describing possible careers in MBB. MBB also has an Undergraduate Resources website with links for Postgraduate and Professional School Requirements and Career Services. We plan to add testimonials from MBB graduates who have found good jobs due to their MBB degree.
H) MBB will work with the Faculty of Science to explore the development of a Life Sciences Program.	The Life Sciences Curriculum is being considered at the Faculty of Science level. Our removal of one 3-unit course from our LD curriculum will help to make the LSC more feasible. MBB is enhancing its Life Sciences programming by introducing the <u>Concentration in Infection & Immunity</u> (approved by Senate). We are also considering a second <u>Concentration in Cells and Disease</u> .
1.1.2 Graduate Program	
A) With oversight from the Departmental Graduate Studies Committee, MBB will review MBB 801 (Student Seminar in Molecular Biology and Biochemistry) to ensure consistent course content regardless of instructor. MBB 801 will include career planning and professional development activities.	MBB 801 has been fully revised, adding valuable content that includes career planning, guest lectures from industry, the health sector and academia, lab notebook and CV best practices, advice on presentations, etc. This course also has new content aimed at addressing EDI issues. The course curriculum is shared among instructors to ensure that it is consistent from one offering to the next.
B) MBB will develop a 2 unit Seminar Course that will be aligned with the Departmental Seminar Series with the	As of September 2022 this 1-unit course is a required course for MBB graduate students. It is being offered initially as MBB 871 and will be regularized as <u>MBB 803-1: Department Seminar Series</u> . Grad students are required to take this course twice in their first year of the program.

<p>goal of reducing course load requirements and enhance graduate student attendance at seminars.</p>	<p>These 2 units will count to their required 12 units for MSc, 15 units for students transferring to PhD, and 15 units for PhD students entering with a BSc. PhD students entering with a MSc will be required to take 8 units. Two months into the first offering of MBB 803 MBB reports that seminar attendance by graduate students has improved markedly. Furthermore, whereas in previous semesters graduate students rarely asked questions despite being prompted by the host, question period now is dominated by the students and seminars often run long because of it. And questions come from students outside of MBB 803 as often as from those taking the course. This is a very positive development and hopefully represents a shift in department culture that is enhancing the graduate student experience.</p>
<p>C) MBB will develop and implement strategies for the recruitment of quality graduate students, including improvements to the MBB website and hosting an MBB Grad Open House. MBB will also explore the possibility of having a junior Faculty member giving a research seminar at other BC Universities where they can promote graduate opportunities in MBB.</p>	<p>We have developed a new promotional brochure directed at potential graduate students. MBB faculty members attended a Graduate Student Recruitment Fair on Sept. 29th at UBC and plan to make this fair an annual event. As of September 2022 MBB established a <u>Recruitment and Outreach Committee</u> (ROC) tasked with promoting both undergraduate and graduate MBB programs and maintaining stronger ties with MBB alumni. We set up an MBB Twitter account to communicate news to MBB grad students and other interested followers, and are setting up a LinkedIn account to connect with MBB alumni. Working with the new FoS Associate Dean – Graduate Studies, we will explore opportunities to do Zoom-based presentations at colleges and universities throughout the province to inform potential students of our department.</p>
<p>D) MBB will develop and implement a plan to address Equity, Diversity and Inclusion in the recruitment of graduate students.</p>	<p>Recognizing the impact of high inflation on many graduate students, we recently adopted a plan to increase our minimum graduate student stipends from \$23K to \$25K beginning Jan. 2023, and to \$27K for MSc students and \$29K for PhD students beginning in Sept. 2023. MBB hired an Indigenous Assistant Professor, Dr. Dustin King, a first in the Faculty of Science. Dr. King’s presence in the department and in classrooms will help MBB feel more inclusive and welcoming for indigenous students. Students interested in graduate studies in MBB will see a diverse and gender-balanced student and faculty body. We completely revised the <u>MBB website</u> to match the Common-Look-And-Feel format adopted by SFU and have been working hard to insert pictures of students and faculty that reflect its diversity. MBB faculty take advantage of training opportunities offered by the Faculty and University to educate us on unconscious bias in hiring and training of HQP and to continue to develop our best practices in EDI.</p>

<p>E) MBB will continue to monitor graduate program completion times and will implement strategies to reduce MSc completion times.</p>	<p>With the new hard cap on graduate program completion times dictated by the University, MSc and PhD completion times will be reduced as the next generation of students complete their degrees. For those students who are grandfathered under the old rules, efforts by the Departmental Graduate Studies Committee Chair and Graduate Program Assistant have hastened completion for at least some students. MBB carefully monitors graduate program completion. Students must request an extension should they go over 9 semesters (Masters) and 18 semesters (PhD students). A number of students have requested extensions due to COVID delays.</p> <p>We have implemented a number of changes that will further reduce completion times. Our stipend increases are guaranteed for students within the first 2 years of the MSc program, the first 4 years for students entering the PhD program with a MSc, and the first 5 years for students who transfer from the MSc to the PhD program, effective from their MSc start date, providing an incentive for students to complete within those timelines. We introduced a rule against requiring that students TA more than 2 semesters per year. We reduced PhD course requirements for direct-entry and transfer-to-PhD students by 3-credits – they are now required to complete 15 units rather than 18. (Students entering the PhD program with an MSc degree will still be required to complete 8 units of required courses [MBB 801, 803 and 806]). We introduced replacement courses (Colloquia and the new Dept Seminar course) that are intended to lighten course loads for both MSc and PhD students. These changes provide more time for research, which should further reduce completion times.</p>
<p>F) MBB will explore the development of an Accelerated MSc program.</p>	<p>We have not yet had an opportunity to explore the Accelerated MSc program but expect that it will be very attractive for some students, particularly those applying to professional programs like Medicine and Dentistry.</p>
<p>G) MBB will collaborate with the MBB Graduate Caucus to develop a graduate student/PDF research seminar series.</p>	<p>With the support of the department the MBB Graduate Student Caucus introduced a monthly seminar series for graduate students and PDFs. Two such seminar sessions have been completed very successfully and with excellent attendance.</p>

<p>2. Research</p> <p>2.1 Action to be taken</p>	
<p>A) MBB will work collaboratively with the Associate Dean of Research to develop plans to support Faculty members experiencing a loss of research funding. One approach will be to identify collaborative grant opportunities and these potential collaborations may extend across departmental boundaries.</p>	<p>In progress. The Faculty of Science Grants Facilitators have performed a thorough review of faculty member grant application/success statistics and flagged faculty who are not actively pursuing new funding. The MBB Chair has had some discussions with relevant members but requires further support from Administration to encourage greater engagement from these members.</p>
<p>B) MBB will continue to provide information to both the Faculty of Science and the University Administration concerning serious issues with Research Computing, including delays to research, loss of productivity and negative impacts on contracts, grants and damage to stakeholder relationships.</p>	<p>The MBB Chair continues to raise the issue of insufficient WIFI, storage and processing capacity and IT support for MBB. Fiona Brinkman and William Hsiao serve on the newly formed IT Strategies Research Experience Sub-committee, which is providing input to SFU IT regarding needs and solutions moving forward. This will culminate in an IT action plan that will hopefully address our challenges and is already resulting in the prioritization of several activities to improve the research experience.</p>
<p>C) MBB will create an Awards Committee to nominate Faculty, Staff and Students for awards.</p>	<p>MBB handles nominations through the Chair and Tenure & Promotion Committee. In 2019 MBB nominated Teaching Technician Ziwei Ding for an SFU Staff Achievement Award; in 2021 Lab Operations Manager Deidre DeJong-Wong was nominated for the same award, which she won. In 2021 MBB nominated a member for the Royal Society of Canada and for the SFU Excellence in Teaching Award. In 2022 MBB nominated 4 members for Distinguished Professor, two members for the FoS Excellence in Research Award (Peter Unrau was successful), one member for an Excellence in Graduate Supervision and one member for the FoS Excellence in Teaching Award. Grad Program Manager Mimi Fourie was nominated for an Excellence in Service award, which she won. Ingrid Northwood was nominated for a Faculty of Science Excellence in Teaching award, which she won.</p>

<p>D) MBB will continue to work with departments within the Faculty of Science, as well as the Faculty of Health Science, on common research interests.</p>	<p>Throughout its development of the new 200-level lab course MBB 229, MBB worked with stakeholders, with members of FHS and Biology serving on the ad hoc course development committee. However due to lack of funding/lack of support from the University, we must offer this course across two teaching labs and thus, enrolment is limited and we are unable to offer MBB 229 as a service course as was originally intended.</p> <p>MBB also worked closely with FHS to offer a joint Infection & Immunity Concentration, but FHS was unable to adapt its curriculum to the Concentration, thus MBB is offering the Concentration on its own. We hope in the future to expand this to a joint Concentration and continue to look for opportunities to work with other departments/units.</p> <p>MBB is very interested in offering a Biomanufacturing Program to undergraduates. Biomanufacturing is a rapidly growing industry with many local companies in need of qualified personnel. No program at SFU (or, to our knowledge, in the lower mainland) offers such a program. This represents an exciting opportunity for SFU but one that will require substantial effort and commitment by the VPA, including providing more faculty positions for research in this field to build teaching capacity, providing infrastructure and space, and establishing strong partnerships with industry. A Biomanufacturing Program at SFU would involve the FHS, Business and Engineering Sciences.</p>
<p>3. Administration</p> <p>3.1 Action to be taken</p>	
<p>A) MBB will update a “how to manual” for each main office position so that essential tasks can be covered in the event of illness or absence and all office staff will be informed of the location of the manual.</p>	<p>We have prepared “how to” manuals for each main office position. These continue to be updated/refined. The Chair is also working on a detailed timeline of Chair’s duties that will be useful for succession.</p>

<p>B) The Chair’s secretary, Graduate Program Assistant and Undergraduate Program Assistant all occupy a very cramped, open concept space with no privacy or ability for confidential conversations. MBB places a high priority on the redesign and renovation of the MBB office.</p>	<p>The MBB office has been redesigned to provide substantially more space and privacy for personnel. While our original plan to expand the floor space in the MBB office was prohibitively expensive, the office underwent a more modest renovation to remove cubby holes and replace them with a wall, which increased the space for the Undergraduate Program Assistant. The Chair’s Secretary has moved into the small room within the office, previously used as a conference room, providing much more space in the main office for the Grad Program Assistant. Dividers have been ordered for privacy and MBB members are advised to come into the office only when asked. New furniture has been ordered for all personnel including standing desks, where desired.</p>
<p>C) MBB will explore IT options to allow Faculty members to attend Faculty meetings remotely, particularly joint members at the BCCA.</p>	<p>MBB offers its weekly seminars and monthly faculty meetings in hybrid form, with members having the option to attend in person or via Zoom. Many meetings are also run via Zoom. However, the unreliable WIFI at SFU and in the South Sciences Building makes these meetings challenging.</p>
<p>4. Working Environment 4.1 Action to be taken</p>	
<p>A) MBB will invite Health and Counseling Services to offer a workshop annually for all Faculty and Staff aimed at recognizing and responding to student mental health concerns.</p>	<p>One such workshop was offered in 2019 (2020) but has not been offered since due to COVID. MBB intends to resume these workshops. We will also work with the Graduate Student Caucus to provide relevant workshops for Grad students.</p>
<p>5. Postdoctoral Fellowships</p>	

5.1 Action to be taken	
A) MBB will work with postdoctoral fellows to identify ways to provide more mentoring and integration within the department.	PDFs participate the Grad Seminar Series. PDF Krysta Coyle is also presenting for the Nov. 25 th MBB seminar.

Dean's Comments on the Mid-Cycle Report

I am very impressed by the successes and ongoing positive strides by MBB to address the recommendations of the External Review Committee, especially considering the current challenging period (2019-present). Similar to all units in Science, MBB is constrained by resources to address curricular needs, for example the development of a key undergraduate laboratory course (1.1.1.C; MBB 229); budgetary support from the VP-Academic would be appreciated to support this goal. Regarding graduate training, I applaud the department for raising their minimum stipend (1.1.2D); however, also realize that research grants have not increased, costs keep rising, the Canadian dollar keeps falling (many reagents are purchased in USD, Euro, etc.), which will likely lead to fewer graduate students in MBB. Again, I would ask the university to consider ways in maintaining or even increase research competitiveness by reducing graduate tuition, creating affordable housing, among other possibilities. Even if MBB can attract higher quality students, we must retain them in the face of the economic challenges of living in the Lower Mainland. Although there are many other aspects worthy of comment in this report, I will emphasize the hiring of Dr. Dustin King, Science's first Indigenous Scientist, the many awards won by staff and faculty recently, and the overall esprit de corps of MBB that contributes to its success.

Dean's Signature

Date



10.28.2022

Mid-Cycle Assessment Plan Reporting Template

Unit: Department of Molecular Biology and Biochemistry

Contact Person: Lisa Craig, Chair, Department of Molecular Biology and Biochemistry

Date:

This template is designed to help units report on their Educational Goals Assessment for the mid-cycle reporting period. *(Textboxes will expand as you type)*

- 1) Who were the members of your Educational Goals Assessment team? Please outline who has worked on the assessment.

Edgar Young (Associate Professor), Lisa Craig (Professor and Chair)

- 2) Did your unit revise or update your Educational Goals and/or your Curriculum Map? Please outline any changes you made.

Undergraduate Program Goals: Minor change in order of Undergraduate Goals and in text to remove redundancy.
Graduate Program Goals: Goals have been reframed in the active form. ("By the end of the program students should be able to ...")

- 3) Did you change any aspects of your Assessment Plan from your Action Plan? Please outline any changes you made.

We recently developed an Assessment Plan. No assessments have been done to date.

- 4) Please use the table below to outline the assessment you have done to date. Add or delete any rows as needed.

MBB UNDERGRADUATE PROGRAM EDUCATIONAL GOALS

Description of Assessment Method(s):	Describe Key Findings, Analysis and Interpretation:	What improvements have been made, or potential improvements considered, as a result of this assessment?
<p>The following procedure was used for each Undergraduate Program Educational Goal. Because our 400-level courses are combined with 700-level graduate student courses these Educational Goals apply to graduate students as well.</p> <p>Step 1. Compilation of a list of MBB courses addressing each Goal and the mode of student tasks (e.g. exam questions, written assignments, presentations) assigned in the course to assess how well students attained the Goal. The list is compiled based on an instructor poll.</p> <p>Step 2. Compilation of a portfolio of up to four representative example tasks that test Goal fulfilment. For each task, the specific instructions given to students and the grading rubric are collected. The instructor verifies that knowledge and skills gained in the course should lead to success in the task (i.e. success was not possible for an incoming student before taking the course). The portfolio is compiled based on information provided by instructors in courses from Step 1 having high student enrolment in the past three years.</p> <p>Step 3. Compilation of portfolio statistics: the number and proportion of students achieving “Pass” (C or higher) vs. “Strong” (B or higher) competency for each task in the portfolio. The statistics set is compiled from information provided by instructors in Step 2.</p> <p>When did you collect the data?</p> <p>Initial instructor poll (Step 1) completed Jan. 2023;</p>	<p>Describe Key Findings, Analysis and Interpretation:</p> <p>Step 1 findings: Relevant courses and task modes have been identified for each Goal (see below).</p> <p>Step 2 and 3 findings (anticipated): Based on the results of the initial poll (Step 1), each Goal is addressed at each level of the MBB Undergraduate Program (100 to 400).</p> <p>The criteria for "Meeting the Goal" is that the majority of students achieve a “Pass” (C or higher) for example tasks.</p> <p>Through assembly of the portfolio and analysis of statistics we will evaluate success of each Goal at each level (100-400 and 700), with student success rates providing an indicator of student development in the Program.</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p> <p>The results of the Assessment will be released to Faculty members. The Departmental Undergraduate Curriculum Committee (DUCC) and the The Departmental Graduate Curriculum Committee (DGSC) will seek faculty input regarding the process, the metrics for success, the refinement of tasks to best meet the Educational Goals, and the Goals themselves. Based on this feedback, these committees will refine the Assessment Procedure and Educational Goals as needed. If we find that a given Goal is not met by the majority of students we will examine the tasks used to assess the Goal to ensure that they are appropriate. If necessary, we will examine relevant course curricula and revise to ensure that course content adequately addresses that Goal.</p>

<p>compilation of portfolio and statistics (Steps 2 & 3) is ongoing.</p>		
<p>Undergraduate & Graduate Course Educational Goal 1: Articulate testable hypotheses and design experimental or sampling protocols to test these.</p>		
<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses - lab courses (MBB 308, 309, 432) - core (required) lecture courses (MBB 331) - various 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498)</p> <p>Common Task types - lab exercises, written proposals, exam questions - research proposal, thesis and presentation for Directed Research Courses</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
<p>Undergraduate & Graduate Course Educational Goal 2: Apply molecular biology and biochemistry experimental techniques and interpret experimental results</p>		
<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses - lab courses (MBB 308, 309, 432) - core lecture courses (MBB 231, 321, 322, 331) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498)</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

<p>Common Task types</p> <ul style="list-style-type: none"> - lab exercises, lab reports, written assignments, exam questions - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
<p>Undergraduate & Graduate Course Educational Goal 3: Use appropriate analytical and statistical methods for quantitative analysis and graphical representation of data</p>		
<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - bioinformatics/genomics courses (110, 243, 342) - core lecture courses (MBB 222, 321) - lab courses (MBB 309) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - computational & lab exercises, lab reports, written assignments, exam questions - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

Undergraduate & Graduate Course Educational Goal 4: Use databases and bioinformatics tools (molecular database searching, sequence similarity searching, protein databases and modeling)

<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - bioinformatics/genomics courses (MBB 110, 243, 342) - core lecture courses (MBB 222) - lab courses (MBB 308, 309, 432) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - computational & written assignments - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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Undergraduate & Graduate Course Educational Goal 5: Search the primary literature and critically analyze and interpret scientific studies

<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - core lecture courses (MBB 222, 331) - lab courses (MBB 309) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - written assignments, oral presentations, exam questions 	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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<p>- research proposal, thesis and presentation for Directed Research Courses</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
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Undergraduate & Graduate Course Educational Goal 6: Develop coherent arguments supported by relevant and credible evidence

<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - core lecture courses (MBB 222, 231, 321, 322, 331) - bioinformatics/genomics courses (MBB 110, 243, 342) - lab courses (MBB 308, 309, 432) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - written assignments, exam questions, lab reports, oral presentations & discussions - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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Undergraduate & Graduate Course Educational Goal 7: Critically evaluate news/information/current events related to molecular biology or biochemistry topics

<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - core lecture courses (MBB 222, 231) - lab courses (MBB 308, 309, 432) - various 300 & 400/700 level course <p>Common Task types</p> <ul style="list-style-type: none"> - written assignments, exam questions, oral presentations & discussions - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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Undergraduate & Graduate Course Educational Goal 8: Communicate effectively using oral, visual, and written communication, including scientific writing for a scientific, government, industry or general audience

<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - core lecture courses (MBB 222, 322, 331) - lab courses (MBB 308, 309, 432) - various 300 & 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - written assignments, lab reports, oral presentations - research proposal, thesis and presentation for Directed Research Courses 	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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<p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
<p>Undergraduate & Graduate Course Educational Goal 9: Work safely, effectively, cooperatively, collaboratively, and ethically in a lab or other professional setting</p>		
<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - core lecture courses (MBB 331) - lab courses (MBB 308, 309 432) - various 400/700 level courses - Directed Research courses (MBB 481/2/3, 491, 492, 498) <p>Common Task types</p> <ul style="list-style-type: none"> - lab exercises, oral presentations - research proposal, thesis and presentation for Directed Research Courses <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
<p>Undergraduate & Graduate Course Educational Goal 10: Demonstrate an understanding of the language, body of knowledge, methodology, and significance of molecular biology and biochemistry</p>		
<p>Description of Assessment Method(s)</p> <p>Examples of Relevant Courses</p> <ul style="list-style-type: none"> - all MBB courses <p>Common Task types</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

<p>- exam questions, written assignments, oral presentations - research proposal, thesis and presentation for Directed Research Courses</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
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MBB GRADUATE PROGRAM THESIS EDUCATIONAL GOALS

<p>Description of Assessment Method(s):</p> <ol style="list-style-type: none"> 1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation. 2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year. 3. Compilation of the number of students appearing as authors on a research publication in a peer-reviewed journal in MBB-related disciplines. <p>Rationale: The MBB Department intends the list of Graduate Program Thesis Educational Goals 1 through 8 to represent the component skills required to successfully execute a thesis project; the "Additional" Goals 9 and 10 represent scholarly achievement in the public sphere, namely publication (frequently but not always achieved at the PhD level).</p>	<p>Describe Key Findings, Analysis and Interpretation:</p> <ol style="list-style-type: none"> 1. In year 2022, a total of 50 Progress reports were filed for MBB Graduate Students. A rating of "Satisfactory" was recorded for all but 3 students who had a rating of "Satisfactory with Concerns". There were no "Unsatisfactory" ratings. 2. Approximately 10 students graduate each year with an M.Sc. or Ph.D.. 3. The number of student authors is not known but will be determined by surveying supervisors or reviewing Thesis Defense Brochures. 	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p> <p>The results of the assessment will be released to Faculty members. The Departmental Graduate Curriculum Committee (DGSC) will seek their input regarding, as needed:</p> <ul style="list-style-type: none"> - proactive measures to address performance deficiencies - refinement of existing procedures for monitoring progress in students who are behind in progress towards Educational Thesis Goals
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<p>Therefore, completion of an M.Sc. or Ph.D. thesis project (with written thesis and oral defense passed by an Examining Committee) is itself the evidence for a student completing ALL of Goals 1 through 8, and a first-author publication is itself the evidence for a student completing Goals 9 and 10.</p> <p>Graduate students are expected to meet Goals 1 through 8 over several years as they progress in their research thesis. Each year, every MBB graduate student is evaluated by their Graduate Supervisory Committee based on the Program Goals, and an Annual Progress Report is filed in which a rating of "Satisfactory" indicates suitable progress towards achieving Goals. In cases where a student's progress to a Goal is slower than expected for the training level, a rating of "Satisfactory with Concerns" or "Unsatisfactory" will be given.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
Graduate Thesis Educational Goal 1: Critically interpret research literature and integrate published findings into their own research.		
<p>Description of Assessment Method(s)</p> <ol style="list-style-type: none"> 1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation. 2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year. 	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

<p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>		
<p>Graduate Thesis Educational Goal 2: Develop hypotheses and design experiments to test these incorporating appropriate controls.</p>		
<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
<p>Graduate Thesis Educational Goal 3: Demonstrate proficiency in data collection using the appropriate instrumentation.</p>		
<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>When did you collect the data?</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

<p>Compilation of student statistics for 2022-2023 is underway.</p>		
<p>Graduate Thesis Educational Goal 4: Troubleshoot problems that arise in research.</p>		
<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
<p>Graduate Thesis Educational Goal 5: Critically interpret results with an understanding of the statistical methods used.</p>		
<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>

Graduate Thesis Educational Goal 6: Communicate effectively using oral, visual and written formats.

<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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Graduate Thesis Educational Goal 7 (PhD students only): Contribute new knowledge and information in the field of molecular biology and biochemistry.

<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>3. Compilation of the number of students appearing as authors on a research publication in a peer-reviewed journal in MBB-related disciplines.</p> <p>When did you collect the data?</p> <p>Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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Graduate Thesis Educational Goal 8 (PhD students only): Disseminate this knowledge/information through peer-reviewed publications and presentations at research conferences and invited talks.

<p>Description of Assessment Method(s)</p> <p>1. Compilation of the number of continuing graduate students achieving "Satisfactory" rating at annual Progress Meeting evaluation.</p> <p>2. Compilation of the number of students successfully completing an M.Sc. or Ph.D. degree each year.</p> <p>3. Compilation of the number of students appearing as authors on a research publication in a peer-reviewed journal in MBB-related disciplines.</p> <p>When did you collect the data? Compilation of student statistics for 2022-2023 is underway.</p>	<p>Describe Key Findings, Analysis and Interpretation:</p>	<p>What improvements have been made, or potential improvements considered, as a result of this assessment?</p>
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5) Please use the table below to update your assessment plan for the coming period before your next External Review. Add or delete any rows as needed.

<p>Educational Goal 1:</p>			
<p>Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)</p>	<p>What would indicate that students had met the EG?</p>	<p>Is this direct or indirect?</p>	<p>When do you plan to collect the data?</p>
<p>Educational Goal 2:</p>			
<p>Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)</p>	<p>What would indicate that students had met the EG?</p>	<p>Is this direct or indirect?</p>	<p>When do you plan to collect the data?</p>

Educational Goal 3:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?
Educational Goal 4:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?
Educational Goal 5:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?
Educational Goal 6:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?
Educational Goal 7:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?
Educational Goal 8:			
Description of Assessment Methods: (e.g. Term paper from Course X, will randomly sample 20% of student work; exit survey of graduating students)	What would indicate that students had met the EG?	Is this direct or indirect?	When do you plan to collect the data?

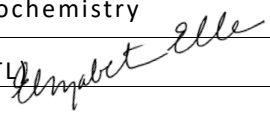
6) How do you plan on sharing your findings within your unit?

Following each assessment, a summary report will be distributed to all MBB Faculty. The full Portfolio of tasks will be made available to MBB Faculty on the MBB website in the Faculty & Staff Portal. With feedback from faculty the DUCC and DGSC will propose Assessment modifications and curriculum revisions as needed. These will be discussed in monthly departmental meetings and annual retreats. Course changes will be implemented by course instructors.

7) Assessment Timeline

Next External Review: [2028](#)

MEMORANDUM

ATTENTION:	Lisa Craig, Chair, Department of Molecular Biology and Biochemistry
FROM:	Elizabeth Elle, Vice-Provost, Learning & Teaching (for SCUTL) 
RE:	MBB Mid-cycle Educational Goals Assessment
DATE:	March 20, 2023

The Senate Committee for University Teaching and Learning has recently been charged with providing feedback to units in their mid-cycle assessment of Educational Goals (EGs). Molecular Biology and Biochemistry has completed an important first step, designing an assessment plan, and mapping EGs onto courses. We especially appreciate how you've included reporting back to faculty members at each step of the work.

You have identified a number of courses, and a diversity of assignments identified where program EGs could be assessed. You note that you plan to collect rubrics for assignments within courses, and this will likely allow you to more clearly link individual assignments to your program level EGs. This is a great start. You then plan to use the grades earned (as noted on the rubric?) for the tasks that have been linked to the EGs. This is a good way forward to make the work of assessment more manageable, and a method other units have been using to good effect. Our only concern with this plan is that it seems overly ambitious, and we have seen that in some cases when units have a very ambitious plan it can lead to inertia.

You have about the maximum number of EGs (10) we recommend, and are considering diverse tasks for assessment in a large number of courses. This can mean a lot of work, and more data than you can do much with. We recommend that you invest time towards deciding what you would like to learn about your undergraduate and graduate programs. We remind you that not all EGs need to be assessed in each year; the purpose of these assessments should be to help you learn what you want to know. Instead, perhaps you can pick just one or two areas your unit would like to focus on for the remainder of this external review cycle. You've recently added a second year lab course, and have made other changes to your curriculum. What would help to inform your understanding of the successes and areas for further improvement, in the context of your goals for your students? You might consider visiting our dedicated [educational goals website](#) to help you with the "define" stage, and choose a small number of the existing EGs for your attention between now and your next external review, rather than attempting to perform assessment of all goals in all identified courses. We also tend to recommend focussing on upper division courses, as your interest, as noted in your materials, is on achievement at the end of the MBB degree.

Regarding achievement at the end of the degree, we suggest that the directed research courses and theses that you mention frequently in your assessment plan may be a very good source of information, especially given the way several of your EGs connect to the combination of lab techniques and

communication skills. To the extent your majors take advantage of these experiential activities you will likely learn quite a lot by digging into the written work from directed readings and thesis courses.

Should you wish some support with defining your goals, analysis of your findings, or to do an exit survey of your graduands, we encourage you to reach out to LEAP, the [Learning Experiences Assessment and Planning](#) group in the AVP-LT portfolio (email them at: leap@sfu.ca). There are staff on the team with expertise in EG assessment and survey analysis, and they are here to help you.