MEMORANDUM

To: Academic Programs Committee of University Council

Copy: Dr. Jeremy Lee, Department of Biochemistry, Microbiology & Immunology

From: Martha Smith, Associate Dean, CGPS

Date: December 11, 2019

Re: Program Merger – Biochemistry and Microbiology & Immunology

As a result of the Graduate Program Review process and strategic planning processes in the College of Medicine, the two independent departments of Biochemistry, and Microbiology & Immunology were merged effective July 1, 2018. Merging the two independent graduate programs would provide more cohesive programming and enrich the experience for the graduate students.

The merger of the two programs would have all graduate students entering a new field of study “Biochemistry, Microbiology & Immunology”. Existing students would have the option to remain in their current program or transfer to the new field. The CGPS requests that APC approve the proposal effective May 1, 2020.

The proposal to merge the two programs was approved by the Graduate Programs Committee on September 30, 2019. The proposal was subsequently approved by the Executive Committee of CGPS on November 25, 2019.

Attached please find the full program proposal and supporting documents.

If you have any questions, please contact Kelly Clement at kelly.clement@usask.ca or 306-966-2229
On November 25, 2019, the Executive Committee (EC) of CGPS considered a recommendation from the Graduate Programs Committee (CGPS) to merge the Biochemistry and the Microbiology & Immunology graduate programs.

There was extensive discussion at the Executive that included reminders that multiple graduate programs can be housed within the same academic unit. The EC tasked the Dean to ensure clarification on the program merger process has a clear process. The question at hand is that this is not ‘new programming’ but rather merged programming within an already established administrative structure.

**Accepted Motion:** To approve the merger of Biochemistry and Microbiology & Immunology graduate programs on the condition that the corrections and clarifications to their policies identified by the graduate programs committee be incorporated and on the condition that BIOC/MCIM have identified the duration of financial support and the process of renewal of support at the Masters and at the PhD level. *Heavin/Misra*

*Members agreed that this merger makes a lot of sense as one of the reasons for the amalgamation of BIOC and MCIM in the first place was to have a stronger department and stronger graduate student base while increasing collaborative efforts between the legacy departments.*

The attached appendix provides additional background for consideration. If you have any questions, please contact Dean Trever Crowe at trever.crowe@usask.ca or by phone at 966-5759.
MEMORANDUM

To: Executive Committee of CGPS

Copy: Dr. Jeremy Lee, Graduate Chair, Biochemistry, Microbiology & Immunology

From: Graduate Programs Committee

Date: October 28, 2019

Re: Merger of Graduate Programs in Biochemistry and Microbiology & Immunology

On September 30, 2019, the Graduate Programs Committee considered a proposal to merge existing programs in the fields of 1) Biochemistry and 2) Microbiology & Immunology. The program merger proposal follows the departmental merger that was effective July 1, 2018. Overall, merging the graduate programs seemed logical to provide more cohesive programming for the graduate students.

Existing students would have the option to remain in their existing program, or transfer to the new field of study. New students would be admitted to the new field. The new field of study would have options for Master of Science and Doctor of Philosophy program. While previously, the Biochemistry program had opportunities for Postgraduate Diploma and Direct-entry PhD admissions, those options were not utilized, and the department does not wish to offer those options at this time.

The Graduate Programs Committee was satisfied with the proposal, and the following motion was passed unanimously:
To recommend approval of the merger of Biochemistry and Microbiology & Immunology graduate programs on the condition that the corrections and clarifications to their policies be incorporated. Tanaka/Morrison CARRIED

Following the motion, the following corrections and clarifications were incorporated into the policies and procedures section of the proposal:

- Information regarding leaves of absence was removed and replaced with language to indicate that leaves could be granted in accordance with CGPS policies.

- Information regarding qualifying exams was clarified to indicate that a second attempt was not possible for the purpose of transferring from a master's program to a PhD program.

- Information regarding comprehensive exams was clarified to indicate that students had an option to choose from two format options, and additional information on each format option was incorporated.

- Additional minor changes were incorporated for readability and language currency.

Attached please find:

- The proposal for the program merger with a table demonstrating existing requirements of the two separate fields in comparison to the new merged field.

- Support from David Cooper, Assistant Dean of Graduate Studies in the College of Medicine.

- The Graduate Program Reviews for each of the independent programs are included as well as the responses.

- The policies and procedures for the merged program provide more comprehensive information on the program.

If you have any questions, please contact Kelly Clement at kelly.clement@usask.ca or 306-966-2229
Biochemistry, Microbiology and Immunology Graduate Programs—Request for name change/program merger/replacement program

The following documents are attached:

1. Request for program merger (Form).
2. Biochemistry, Graduate program review 2018.
4. Microbiology and Immunology Graduate Program Review.
5. Comments on Microbiology and Immunology Program review – May 2018
Graduate Program in Biochemistry, Microbiology and Immunology.

Commentary

The intention is to merge the existing programs into one to align with the departmental merger that became effective July 1, 2018. The current Biochemistry program will be the model for the proposed BMI program. Students in both the current Microbiology and Immunology program as well as the Biochemistry program will have the opportunity to complete their program under the new BMI field of study. If any do not wish to transfer to BMI, they will have the opportunity to complete their program under the field of study they were admitted. All new students would enter the BMI program.

As can be seen from Documents 2 and 4, the external reviews of both Departments were generally favourable. The rebuttals (Documents 3 and 5) outline the issues and how they are going to be addressed.

Perhaps the most important issue is faculty renewal. Fortunately, BMI has been given permission to hire two new faculty and three more positions are under discussion (one a Canada Research Chair in cancer biology, a retirement, and a replacement for a member who moved to a clinical department who is also retiring). Also when the Departments were reorganized, one faculty from the original Department of Anatomy decided to move to BMI. Therefore, we are expecting an influx of 5 new faculty members within 2 years. Since the total faculty at present is 28 (with 5 retiring within 2 years) this represents a large turnover. It should also be pointed out, that the issue of new faculty also drove the decision to merge the graduate programs. Simply put, it would be difficult to have a cohesive Department with new faculty having to choose between two graduate programs with which to be affiliated. Moreover, there are a number of shared research interests that span both disciplines. Additionally, the joint graduate program is expected to have 40-50 students which will provide a dynamic research force.

The need for student recruitment was also mentioned as an important issue. To address this we have already recruited 9 new students to the current MCIM M.Sc./Ph.D program this past year. Similarly, 5 have been added to the current Biochemistry program.

In September 2019, the seminar programs (990.0) for the existing programs will be merged so that each student will present their research once per year to the whole Department.
We expect that this will help to forge a Departmental unity and enhance graduate program cohesiveness, another issue that was identified and needed to be addressed.

Another gap identified by the Graduate Review was Professional Development. In 2018, Microbiology and Immunology started to offer some Professional Development and Skills lectures (some with outside speakers) as part of their 990.0 course. This was well received and we intend to have a stand-alone PDS course for BMI graduate students (perhaps with APP graduate students as well) beginning in September 2019. The intention is to involve the students in the choice of some of the speakers as recommended by the reviewers.

Finally, Document 6 is the new Policy and Procedures manual for the merged programs. In general, the Qualifying and Comprehensive exams have been made more flexible as recommended by the reviewers and admission requirements are expected to be tightened subsequent to the merger (e.g. the TOEFL test and GPA averages). As well we have introduced minimum stipends for graduate students which will be consistent across the merged program.
PROPOSAL IDENTIFICATION

Title of proposal: Merging of the Biochemistry and the Microbiology and Immunology Graduate Programs

Degree(s): MSc., PhD.

Field(s) of Specialization: Biochemistry, Microbiology and Immunology.

Level(s) of Concentration:

Option(s):

Degree College: CGPS

Contact person(s) (name, telephone, fax, e-mail): Jeremy Lee (4371) and Sylvia van den Hurk (1559)

Proposed date of implementation: May 1 2020.

Proposal Document

Rationale
The Biochemistry Department and the Microbiology and Immunology Department merged on July 1st 2018 to form a new Department called BMI. The new BMI Department will offer a single undergraduate program in 2021 which prompted consideration for merging the Graduate programs as well. At the first meeting of the new Department in September 2018, there was a proposal for merging the graduate programs for which there was a positive unanimous vote. It is anticipated that there will be several positive impacts as detailed below.

Impact of the change
- impact on students: It is envisaged that many graduate student activities will be merged. These include seminars, research presentations, professional development and faculty/student BBQ’s. The merger will help to provide a more cohesive student body with increased morale.
- impact on faculty: Improved faculty cooperation is to be expected.
- impact on staff: At present the two graduate programs are administered differently. E.g Admissions and regulations for the qualifying and comprehensive exams have different requirements. Merging the programs will lead to simplified procedures and administrative efficiency.
- impact on alumni: None
- affect on other programs, departments, colleges, centres: None
- impact on university-wide systems (e.g. SiRIUS, UniFi, PAWS, U-Friend, Library, About US, etc.): implementation of new program and course codes, and possible one-time update to existing student records
- resource areas such as library resources, physical facilities, and information technology: None
- external impact (e.g. reputation, accreditation, other institutions, high schools, community organizations, professional bodies): A larger merged program is expected to have a larger impact.

Costs
Please describe whether this change will result in any additional costs for the university (ie, repainting signs, technical changes in SiRIUS, PAWS, financial services, etc.):
There will be minor in-kind costs associated with modifications to the Graduate Programs listed in the University Catalogue and updates to the student information system.

Consultation
Please describe any consultation undertaken with other university offices, such as Student and Enrolment Services, Institutional Strategy and Analytics, Institutional Planning and Assessment, Financial Services, Facilities Management, Office of the University Secretary, Information Technology Services, etc. Please attach any memos or emails received about this consultation.

Please also note the “Commentary” and other attached documents.
<table>
<thead>
<tr>
<th>Program</th>
<th>Postgraduate Diploma</th>
<th>Master of Science</th>
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</table>
| **Existing Biochemistry Programs**  | Admission Requirements  
- Language Proficiency Requirements: Proof of English proficiency may be required for international applicants and for applicants whose first language is not English.  
- a cumulative weighted average of at least a 70% (U of S grade system equivalent) in the last two years of study (i.e. 60 credit units)  
- a four-year honours degree, or equivalent, from a recognized college or university in an academic discipline relevant to the proposed field of study | N/A | **Proposed Biochemistry, Microbiology and Immunology Programs**  
*We wish to delete this program. There have been very few students (perhaps 2?) in the last twenty years and it does not serve a useful purpose.* |
| **Existing Microbiology and Immunology Programs** |  | |
| **Diploma Requirements** | GPS 960.0  
GPS 961.0, if research involves human subjects  
GPS 962.0, if research involves animal subjects  
a minimum of 30 credit units | **Admission Requirements**  
- Language Proficiency Requirements: Proof of English proficiency may be required for international applicants and for applicants whose first language |  
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**Degree Requirements**

Students must maintain continuous registration in the 994 course.

- GPS 960.0
- GPS 961.0, if research involves human subjects

1 This is required, though not formally noted in the catalogue description.
<table>
<thead>
<tr>
<th>Direct-Entry Doctor of Philosophy</th>
<th>Admission Requirements</th>
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<tr>
<td>With the recommendation of the unit, direct entry Ph.D. admission is available to exceptionally strong students, who show great promise in terms of academic accomplishments and potential for research.</td>
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<td>• Language Proficiency Requirements: Proof of English proficiency may be required for international applicants and for applicants whose first language is not English.</td>
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<td>• a cumulative weighted average of at least a 80% (U of S grade system equivalent) in the last two years of study (i.e. 60 credit units)</td>
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<td>• a four-year honours degree, or equivalent, from a recognized college or university in an academic discipline relevant to the proposed field of study</td>
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<td>• BIQC 990.0</td>
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<td>• a minimum of 9 credit units at the 800-level</td>
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<td>• We have decided not to allow direct entry without a MSc.</td>
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</table>
**Degree Requirements**

Students must maintain continuous registration in the BIOC 996 course.

- GPS 960.0
- GPS 961.0, if research involves human subjects
- GPS 962.0, if research involves animal subjects
- At least 9 credit units of course work at the graduate level must be successfully completed in the first year of the program.
- Students must enroll in BIOC 990.0 in the Fall and Winter terms.
- BIOC 996²
- comprehensive examination
- qualifying examination
- thesis defense

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**Doctor of Philosophy (with earned Admission Requirements**

- Language Proficiency Requirements: Proof of English proficiency may be required for

² This is required, though not included in the bulleted list in the catalogue
| Master's degree | international applicants and for applicants whose first language is not English.  
- Master's degree, or equivalent, from a recognized university in a relevant academic discipline  
- a cumulative weighted average of at least a 70% (U of S grade system equivalent) in the last two years of study (i.e. coursework required in Master's program) | international applicants and for applicants whose first language is not English.  
- Master’s degree, or equivalent, from a recognized university in a relevant academic discipline  
- a cumulative weighted average of at least a 70% (U of S grade system equivalent) in the last two years of study (i.e. coursework required in Master’s program) | international applicants and for applicants whose first language is not English.  
- Master's degree, or equivalent, from a recognized university in a relevant academic discipline  
- a cumulative weighted average of at least a 70% (U of S grade system equivalent) in the last two years of study (i.e. coursework required in Master's program) |

| Degree Requirements | Students must maintain continuous registration in the 996 course.  
- GPS 960.0  
- GPS 961.0, if research involves human subjects  
- GPS 962.0, if research involves animal subjects  
- A minimum of 9 credit units at the 800-level including any such | Degree Requirements | Students must maintain continuous registration in the 996 course.  
- GPS 960.0  
- GPS 961.0, if research involves human subjects  
- GPS 962.0, if research involves animal subjects  
- MCIM 990.0  
- MCIM 996.0 | Degree Requirements | Students must maintain continuous registration in the 996 course.  
- GPS 960.0  
- GPS 961.0, if research involves human subjects  
- GPS 962.0, if research involves animal subjects  
- MCIM 990.0  
- BMIS 990.0  
- BMIS 996.0  
- comprehensive examination |
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<tr>
<th>Transfer from Master’s to PhD</th>
<th>Degree Requirements</th>
<th>Degree Requirements</th>
<th>Degree Requirements</th>
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</table>
| Courses taken at the M.Sc. level. | - BIOC 990.0  
- BIOC 996.0  
- comprehensive examination  
- qualifying examinations  
- thesis defense  
Note: the advisory committee may recommend courses to address specific deficiencies of the student. | - a comprehensive examination to establish candidacy for the awarding of the Ph.D.  
- if the student entered the Ph.D. program directly from another institution, a minimum of 3 credit units  
- thesis defence  
Note: the advisory committee may recommend courses to address specific deficiencies of the student. | - qualifying examinations  
- thesis defense  
Note: the advisory committee may recommend courses to address specific deficiencies of the student and/or to complement the research program. |
| Note: the advisory committee may recommend courses to address specific deficiencies of the student. | | | |

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3 This language is unusual. There is no minimum cu required for PhD students in Biochem currently.
Report Form for Program Termination

Program(s) to be deleted: The fields of 1) Biochemistry, and 2) Microbiology on the Master of Science and Doctor of Philosophy degree programs

Effective date of termination: May 2020. Students already enrolled will be permitted to complete their programs

1. List reasons for termination and describe the background leading to this decision.

2. Technical information.

2.1 Courses offered in the program and faculty resources required for these courses. All resources will be redirected to the new combined BMIS graduate programs.

2.2 Other resources (staff, technology, physical resources, etc) used for this program. All resources will be redirected to the new combined BMIS graduate programs.

2.3 Courses to be deleted, if any. Courses to be relabeled. The individual 99X courses will be replaced with BMIS 99X courses.

2.4 Number of students presently enrolled.

2.5 Number of students enrolled and graduated over the last five years.

3. Impact of the termination.

   Internal

3.1 What if any impact will this termination have on undergraduate and graduate students? How will they be advised to complete their programs? Program mergers at the undergraduate level have already been approved. The combined program is anticipated to be an improvement over the three independent programs. Current students will have a choice to transfer to the new program or complete the program under the previous field of study.

3.2 What impact will this termination have on faculty and teaching assignments? Combining the programs is anticipated to result in better utilization of teaching resources.

3.3 Will this termination affect other programs, departments or colleges? No

3.4 If courses are also to be deleted, will these deletions affect any other programs? N/A
3.5 Is it likely, or appropriate, that another department or college will develop a program to replace this one?

No. Three independent programs are being replaced by one cohesive program. Other units will not be impacted.

3.6 Is it likely, or appropriate, that another department or college will develop courses to replace the ones deleted?

N/A

3.7 Describe any impact on research projects.

N/A

3.8 Will this deletion affect resource areas such as library resources, physical facilities, and information technology?

Changes to physical facilities for the combined department are already in place to support the new combined program replacing the program deletions.

3.9 Describe the budgetary implications of this deletion.

While there are some initial in-kind contributions for system related work, overall budget implications would be negligible.

External

3.10 Describe any external impact (e.g. university reputation, accreditation, other institutions, high schools, community organizations, professional bodies).

N/A

3.11 Is it likely or appropriate that another educational institution will offer this program if it is deleted at the University of Saskatchewan?

N/A

Other

3.12 Are there any other relevant impacts or considerations?

3.13 Please provide any statements or opinions received about this termination.

(Optional)

4. Additional information. Programs which have not undergone recent formal reviews should provide additional relevant information about quality, demand, efficiency, unique features, and relevance to the province.
November 05, 2018

Kelly Clement
Assistant to the Associate Dean,
Graduate Academic Affairs and Programs
College of Graduate and Postdoctoral Studies
University of Saskatchewan

RE: College of Medicine Support for the BMI graduate programs merger

Dear Ms. Clement:

I am writing to confirm that the College of Medicine supports the proposed merger of graduate programs within the new Department of Biochemistry, Microbiology and Immunology (BMI). This fusion of their two graduate programs has long been anticipated as an outcome of the BMI merger.

Sincerely,

[Signature]

David M.L. Cooper, PhD
Assistant Dean Graduate Studies College of Medicine
Professor & Canada Research Chair
Department of Anatomy, Physiology and Pharmacology
College of Medicine
University of Saskatchewan
107 Wiggins Road
Saskatoon, SK, S7L 5E5
SUMMARY ASSESSMENT - BIOCHEMISTRY

Does this program, as it is resourced, meet the expectations of quality as compared to other similar programs delivered at other institutes across Canada?

☒ Meets the expectations for a quality graduate program

What did you find most commendable about the program (maximum two)?
1. High quality of graduate students in the program.
2. Access to high quality equipment and resources for many research areas

What, if any, enhancements would you recommend at this time (maximum two)?
1. Renewal of faculty complement.
2. Continue to improve graduate student funding.

Would you recommend that students apply to this program? Would you considering hiring, recommending, or recruiting one of its graduates to your academic or research unit?
Yes

We provide a summary assessment in each sub-category, with further details provided in the full report.

1. Program Objectives and Curriculum

The program meets the standards expected of a modern graduate program in Biochemistry, with clear goals and a solid curriculum. Some minor adjustments might be considered, as detailed in the attachment.

2. Program Enrolment and Student Funding

The overall quality of the graduate student population was impressive as was their devotion to the Department. The Review Committee (RC) was concerned about the clear downward trend in student numbers, which is likely linked to reduced levels of research funding and the number of research active faculty in this Department. Recent improvements to graduate student funding is very good, and should continue. The international student tuition differential poses a very significant threat to this program and this must be seriously reconsidered.

3. Student Outcomes

Overall student outcomes, including number of publications upon graduation and fraction of cohort who find work in relevant fields appears entirely reasonable. The RC had some concerns about typical time in program for the MSc, while the typical time in program for the PhD was appropriate.
4. Learning Environment

There was a strong sense of program ownership, pride and identity amongst the graduate students, which belied the concerns of the faculty noted in the self-assessment document. The RC had major concerns about the current and proposed methods for allocating student office space; this has the potential to be very negative for the Department and must be reconsidered.

A small number of alumni raised the spectre of discriminatory treatment of some international students. Discussions with current graduate students, including a one-on-one conversation with an international student who claimed knowledge of the source of these complaints, strongly suggests this is a case of a very small number of disgruntled former students. To the best of our ability to judge, current international students feel both supported and respected by the faculty and there is no systematic issue to be addressed. There was strong support from the graduate students in favour of the current two committee meetings per year format.

5. Faculty Profile

The faculty demonstrate research strength as evidenced by a good publication record, both in terms of quality and quantity of publications in the peer-reviewed literature. As noted above, faculty renewal will be crucial for continued success of the Department. Enhancing faculty diversity will also be critical, and there is significant support in the Department for this renewal.

6. Administration

Administrative support for the program appears to be adequate, though the upcoming merger of the Department with Microbiology and Immunology might cause significant administrative challenges. The faculty have a number of concerns as to how this merger will be carried out and affect the graduate program. Significant care and attention will be required in order to ensure what is a successful research program in the College of Medicine continues and builds upon its success.

REVIEWERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
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<tbody>
<tr>
<td>Mark Glover, Dept. of Biochemistry, University of Alberta.</td>
<td>May 3rd / 2018</td>
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<tr>
<td>Matthew Paige, Dept. of Chemistry, University of Saskatchewan.</td>
<td>May 3rd / 2018</td>
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<tr>
<td>Jan Rainey, Dept. of Biochemistry and Molecular Biology, Dalhousie University.</td>
<td>May 3rd / 2018</td>
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Review Report – Biochemistry

Overview

Over a period of two days, the Review Committee (RC) met with members of the College of Graduate and Postdoctoral Studies (CGPS) – namely, the Interim Dean and Associate Acting Dean – and the College of Medicine (CoM) – namely, the Assistant Dean Graduate Studies. The RC also met with the Departmental Graduate Studies and Research Committee, including the Department Head as an "ex officio" member, and with members of the faculty. Facility tours of the Health Sciences complex and of the Canadian Light Source, a unique and internationally-renowned research facility that provides strong support to the graduate program, were also valuable components of the review. Finally, opportunities to meet with students from all stages of the graduate program were provided, both in an informal (lunch) setting and in a more formal session open to any interested students. The latter session was very well attended, with ~12 graduate students, giving the RC an opportunity to discuss the program with almost 2/3 of the current graduate student roster. The review concluded with exit meetings with representatives of the Department (Head and Graduate Chair) and with the CGPS (Acting Associate Dean). In all, the RC felt that it was able to develop an excellent understanding of functioning of this graduate program over the course of this intensive visit. The RC was particularly appreciative of the efforts of Mr. Nathan Risling from CGPS in coordinating the review.

The RC’s overall assessment is that the Department of Biochemistry runs a strong graduate program that is generating well-educated and trained students, produces high-quality research and provides adequate financial support to its students. Overall student outcomes are positive and the students have a strong sense of pride, program ownership and unit identity. The principal challenge faced by this program going forward is that enrollment is systematically dropping and there is an increasingly urgent need for faculty renewal to re-invigorate graduate research. Financial support for graduate students must be maintained and scaled with cost of living, which may be difficult given the current state of federal research grant support. Continued CoM graduate funding support will be crucial here, as will re-consideration of the international student differential tuition. The RC also reviewed available data to assess several alumni comments related to potential discrimination against international students. The RC was of the opinion that this was likely a case of a very small number of disgruntled students and that international students generally felt respected and supported within the Department of Biochemistry.

1. Program Objectives and Curriculum

The program meets the standards expected of a modern graduate program in Biochemistry. The curriculum is very solid with a diverse and fairly comprehensive set of course offerings. Courses are typically cross-listed with upper year undergraduate courses, with most offered every year. Students typically had no issues finding courses to complete their program though, as is often the case, available courses were not always aligned with their specific research interests. Some specialized areas were mentioned as lacking by faculty members, for example plans are in the works for an additional graduate-level course offering in the field of metabolism. Students coming from the Biochemistry BSc program at U of S also noted issues in finding courses, given the cross-listing of almost all courses with undergraduate courses. This is not an unusual situation, however, and students noted that appropriate courses were always found following some searching of offerings in other academic units. Students noted that information regarding which courses are available outside of the Department and appropriate for their programs of study is not always
communicated as effectively as possible. The Department should consider mechanisms to improve this communication.

Both students and faculty showed significant interest in developing a professional skills course. Such a course could include training in grant writing, presentation skills, teamwork, career advancement and similar areas. Direct exposure to people in the field who have chosen a variety of career paths, both the “traditional” academic stream and those outside of academia, was also considered to be an important element of such a course. The Department might consider offering this as a mandatory course for all entry level graduate students, which would serve a dual-purpose of helping to build a sense of community within a given cohort of students and in the Department more generally. There was little enthusiasm amongst the graduate students to make this an additional course requirement, as this would cut into research time; instead, students felt that this should replace one of the more traditional courses required by the program. This latter point may be particularly beneficial to students coming from the U of S BSc program, where course selection is sometimes already noted as a challenge. Faculty might consider this replacement of a traditional course, but there is reasonable concern about overly diluting core academic content.

Some students were concerned that the current structure of the qualifying exam was too focused on memorization of undergraduate-level information and not particularly useful for modern research. The faculty did not necessarily agree, seeing much of the material in the exam as core, essential biochemistry content. The RC members certainly see both sides of this issue and recognize that this is not an easy balance to maintain but encourage the faculty to ensure that the content of the qualifying exam is well-matched to the admissions expectations of the program. For example, if a BSc degree in a field other than biochemistry is considered as appropriate preparation for the graduate program, is it reasonable to expect that [all] students in the program have a comprehensive knowledge of the field or would a somewhat more focused examination that targets testing of knowledge in appropriate sub-disciplines be equally beneficial?

Finally, improvements might be made in how program guidelines and expectations are communicated to the students. Whilst a written PDF description of the program is generally given to new students, this can often be lost, forgotten or become quickly outdated. From student descriptions of the general process, it seems to often fall upon supervisors to provide program guidance. This leads to considerable variability in the quality and quantity of guidance provided. It is recommended that the new Department website provide a detailed guide to the graduate program, as well as clearly state performance expectations on programmatic exams and other formal program requirements. Having formal expectation documents readily available might help to alleviate any perception of unfairness in evaluation of students. Having clear program expectations articulated to incoming students would be likely to minimize potential issues before they arise.

2. Program Enrolment and Student Funding

While the Biochemistry graduate program continues to be one of the strongest in the College of Medicine, there is a clear downwards trend in student numbers over the last few years. This worrisome trend appears to be linked to reduced levels of external research funding, which is a problem across the country, not just in this program. However, another important factor here is a documented decrease in the number of research active faculty. Beyond recent retirements, a significant fraction of the faculty are approaching retirement age and have ramped down research intensity. Thus, there is a clear and urgent need for faculty renewal in order to ensure a vibrant graduate program. This will also provide an opportunity to improve diversity of the faculty which might, in turn, be a major asset for graduate student recruiting.
The Department offers a nationally-competitive annual stipend to its students, particularly those in the PhD program, through a combination of external scholarships, internal scholarships, devolved funds and supervisor research grant contributions. There have been recent advances in terms of student support through CoM Graduate Scholarships. This program, in particular, is an excellent initiative by the CoM and should be continued. The graduate students appreciated the recent improvements to stipend levels, and are grateful that their stipends are at the highest level in the CoM. Students also appreciated recent changes to Department policies that allowed major scholarship winners to see an increase in take-home stipends as opposed to simply benefiting their supervisors’ grant.

The Department must avoid complacency here, however. Stipend levels should be reviewed regularly to ensure that they keep pace with cost of living and fee increases. There are also major concerns related to future tuition hikes and the associated fee differential for international students. This effectively leads to an increased per-student operating grant cost to researchers, an increasingly problematic situation in the present national funding climate. This differential fee was also specifically highlighted by faculty members as a policy that is making it increasingly difficult to attract top-caliber international graduate students, particularly in a landscape where some other U15 universities have entirely done away with graduate student differential fees. The graduate students themselves also noted this as being a major barrier for recruitment and attracting students to U of S. The argument that these fees increase availability of scholarships and potentially improve funding opportunities for international students was viewed by the RC as disingenuous and that the international tuition differential represents a significant threat to this graduate research program.

The RC was somewhat surprised by the complete lack of tri-council scholarships held by graduate students in the Department. This is a concern, but not entirely surprising given the relatively small total number of students in the program and the ineligibility of international students for these awards. RC members from outside of Saskatchewan also noted that an apparent lack of graduate scholarships from the Province is unusual. This is an area of government support where the RC feels that the CGPS and/or University upper administration could seek improvement, assisting in sustainability and competitiveness of the Biochemistry graduate program.

Lack of funding for conference travel for students is an ongoing concern for the Department and students. There are clearly too few opportunities for students to network and present their work at international venues, but again, funding remains an ongoing challenge. There were several locally-organized symposia which were noted by the RC as being very positive. The RC encourages organizers to continue this very solid initiative. The CoM and/or CGPS could also consider providing additional travel support opportunities for graduate students; this would, in turn, be likely to augment tri-council scholarship success rates.

3. Student Outcomes

Outcomes for graduates from this program are in line with typical outcomes in Canada, with a high percentage of graduates being employed and a reasonable number being employed in a field related to their research. Students generally published a good to very good number of papers in peer-reviewed journals during their degree, which improves potential employment outcomes. As noted in section 2, conference participation levels are less competitive; however, the development of high-quality local symposia is a noted significant improvement given an ongoing lack of travel funds.
The RC’s main concern in this evaluation area was the length of time in program for MSc students, which has historically been too long. The cause of the long time in program was unclear, but the RC recommends that careful attention be paid by the Department to this issue. The recently implemented increase in frequency of advisory committee meetings to twice per year might help keep students’ programs on track. The time to completion for the PhD program did not suffer from this issue and meets typical program expectations.

4. Learning Environment

The self-study document suggested that the Department is suffering from low morale and is in danger of losing cohesion as a unit because of the CoM-level decision to merge Biochemistry with Microbiology and Immunology, and because the spatial separation between different labs provided minimal opportunities to interact as a single unit. However, the graduate students still had a clear sense of belonging to the Department and, indeed, strongly identity as members of the Biochemistry Department as opposed to with their various research clusters that span Departments.

The students had a strong desire to build on this sense of community within the Department. Suggestions for how to do this included consistently having graduate students take visiting speakers out to lunch; implementation of one or more student organized and hosted seminar speaker visits per academic year; and, a common course that all incoming graduate students are required take. The latter may fit well with the desire for a professional skills course, as described in section 1. The RC feels, in particular, that efforts to increase student involvement with and engagement in seminars by external speakers should be a short-term priority for the Department as this is something that could be implemented very rapidly; a common year-one course would be a longer-term priority.

There was also a strongly-expressed desire for visible celebrations of student success. For example, successful PhD defences should be publically recognized, as should publications, scholarships and similar positive results. It was also suggested that the presentation portion of thesis defences should be public, to increase visibility. The RC supports these suggestions and believes that these are simple and inexpensive ways of building a sense of community within the Department. A common poster board, computer display or similar in a prominent location might be well-suited to some of this. E-mail digests of “good news stories” to the Department as a whole would also be an effective means of communicating, given the non-centralized location of students and faculty.

An important issue that drew the RC’s attention was a small number of comments from the alumni poll that suggested the existence of discrimination against international students. The RC took this very seriously and discussed the issue with faculty, administration and graduate students. All of these meetings were informative, and we found the gravity with which these comments were treated reassuring. In particular, the RC found the meeting with graduate students to be highly informative. The RC invited international students who might have concerns about discrimination to meet with us individually, and one student approached the RC for a private discussion. The student believed they knew the source of the claims of discrimination (likely two or three students who had struggled academically with the program) and passionately defended the Department’s support for international students. As an example of this support, the student had developed some communication problems with their supervisor, and sought assistance from the Department Head to help resolve the issue. The student felt that they were listened to and treated very respectfully by all parties involved, particularly the Head, and the issue was successfully resolved. The end result was a productive, healthy and mutually-respectful student-supervisor relationship. In total, the RC
found no evidence of systematic discrimination in the Department and while our ability to thoroughly assess this during a brief review is limited, we can reasonably attribute the comments on this subject to a small number of disgruntled students. While this is not ideal, of course, it is an almost inevitable occurrence in any graduate program.

The RC has major concerns as to the current and future approach to allocating space to student offices. At present, four students are assigned to an office, with new students typically assigned to the next available space in the building, without any clear priority to locate them with group members. Available space is often far from their group’s laboratory. There appears to be a seniority system in place where students who arrived earlier are moved to more “prime” space first regardless of whether this will locate them with their research group or not. As a whole, centralized decisions of where to locate students seems deleterious. Newly arrived students, many of whom are new not only to the Department but also to Canada, are those in most need of peer-support and development of working relationships with their research group. Instead, these students appear to have the absolute lowest priority for being situated with their research group even when, anecdotally, there is a free desk available in an office where they would be co-located with their group. The RC strongly recommends decentralization of control over office space to the Department; this will allow for research groups to have their own office space and foster a closer sense of community. Issues were also raised by students about a lack of personalization of office space being allowed (e.g., nothing on the walls, no window coverings allowed despite students being required to sit next to windows that allow anyone walking by able to look in, etc.) These concerns are independent of the lack of control over space allocation, but are very “real” in terms of student comfort, academic experience and overall productivity.

The RC also heard from faculty, students, and administration about a proposed initiative for “hoteling” office space, with students no longer having an assigned desk but rather a locker. In this initiative, students would simply take whichever desk was available when they arrived in their office on a given day. In our view, this is potentially very negative for the students and the Department as a whole. An even further eroding of the sense of “home” for students (notwithstanding the issues noted above) would be extremely off-putting and risks entirely disrupting any sense of ownership and community. This goes against what the Department hopes to achieve. Students and faculty alike were highly dismayed by this idea; students want a “home” in the Department and a permanent office is essential for this. The RC strongly recommends that hoteling not be implemented, at least in Biochemistry where students generally need to spend a great deal of time in the office as well as in the lab and require a dedicated space for data analysis, literature research and writing.

The Department recently changed their program to require two advisory committee meetings per year. This as seen by both students and the RC as a positive development, and this policy should continue.

5. Faculty profile

Despite the challenges associated with faculty renewal (section 2), there is still significant research strength within the Department. This is evidenced by a strong ongoing publication record in high-quality, peer-reviewed journals. While this is a relatively small department and graduate program, it nevertheless represents a broad range of biochemical research areas, with corresponding graduate teaching covering most of these, and does so successfully. There are particular strengths and, perhaps, opportunities related to the Canadian Light Source and these might be pursued more closely. Nonetheless, the challenges posed by imminent retirements and difficult federal and provincial funding environments are growing and faculty renewal will be crucial for the continued success of the Department. As noted above, a more gender-diverse
Faculty complement is of growing importance with the faculty complement currently being entirely male. Faculty members also noted that some particularly important infrastructure supports are currently lacking (e.g., proteomics capabilities). This, correspondingly, was noted as a limiting factor in past recruitments which have been seen as infeasible at the CoM-level due to the up-front cost required in order to successfully develop a research program in these areas. The RC recommends that the CoM consider the degree to which infrastructure may have widespread applicability (vs. only the cost-intensive nature), even if this is initially required primarily to support a given faculty recruitment, rather than dismissing proposals for hiring outright simply based on up-front costs of that recruitment.

6. Administration

Administrative support for the program appears to be adequate, though this may change if the graduate program shows future growth. In addition, the upcoming merger of Departments could result in further stress on administration of the program, though inadequate information is currently available to analyze this in any depth. Concerns were expressed by current faculty about how the graduate program will have to change and how the merger will be carried out. The RC is of the opinion that this must be done with great care and attention to ensure that the program retains its Biochemistry focus. Recruitment and program structure both strongly hinge upon program identity as a Biochemistry program and the RC is concerned that, for example, a “Biochemistry, Microbiology & Immunology” program would not serve either academic unit well. Further loss of identity in a broader “Medical Sciences” graduate program, one of the options that the RC heard mentioned, would likely be even more deleterious for recruitment of students with the requisite training and motivation to succeed in a rigorous biochemistry-focused research-based graduate degree. The graduate program is very solid and with thoughtful renewal could further improve its success. This should be viewed as a priority for the CoM, given its stated desire to improve research intensity within the CoM. The Department of Biochemistry’s graduate program is a true research asset that can be further improved through CoM support.
Comments on Biochemistry Graduate Program Review—May 2018

In general, the Biochemistry Department is in agreement with the findings of the Review Committee. The following comments apply to the review assessments in each sub-category.

1. **Program objectives and curriculum.** (a) The department agrees that improved communication to students and faculty about graduate courses that are available to students is required. A strategy to achieve this will be developed. (b) We agree that development of a “Professional Skills Course” would be helpful in broadening the student’s perspective. The format is currently under discussion, with possible solutions being to develop a stand-alone course(s) which deals with this, incorporating Professional Skills into some of the existing courses, and/or using some of the Mitacs workshops that are available. (c) The qualifying exam may be too broad-based and might be better if it concentrated on the student’s sub-specialties in their area of research. This concern has in the past been expressed by some faculty in the department, and given the comments by the review team, is something that the Graduate Committee will investigate in earnest. (d) The review team suggested that better communication of program guidelines and expectations be provided to students, and not rely solely on supervisors who themselves may be unclear on some aspects. This may include placing some detailed documents on the department website. The department has been frustrated with the College by the lack of control it has over content placed on the Departmental website. A more general concern is the poor design of the College website. The Assistant Dean of Grad Studies in the College is aware of our concerns and has committed to improving the department’s ability to control its content on the College website.

2. **Program enrollment and student funding.** (a) We agree that the only way to reverse the downward trend in enrollment is to reverse the loss of faculty which has occurred over the last 5 years and rapidly replace retiring faculty. (b) The department commits to regularly reviewing the stipend levels to ensure that they keep pace with inflation and tuition increases. It should be noted that the department in the last year established minimum stipend levels of $19,000 and $24,000 for MSc and PhD students, respectively. (d) The differential tuition fee for foreign students is a major concern for both students and faculty. Ultimately, this money will be paid from research funds, further reducing our competitiveness.

3. **Student outcomes.** While we agree that the average length of the MSc. is too long and needs to be addressed, at least some of this problem can be attributed to a number of unusual cases that fell within the time period assessed. These included several cases of students transferred from a PhD to a MSc program, and a case of plagiarism that resulted in a significant extension to the time in program. We are hoping that increasing the advisory committee meetings to two per year will help to keep the students on track. We also feel that an area where we have been too complacent is the monitoring of thesis writing. Past practice has often been to essentially ignore student progress in thesis writing once permission to write has been granted, and this has often resulted in students taking far too long to complete the writing process. It is clear that we cannot rely on supervisors alone to monitor this progress, and some policy regarding monitoring of thesis writing by the advisory committee will be looked into.
4. Learning environment. (a) We agree that increasing student interaction with visiting speakers, and having students organize and host a seminar speaker, are great ways to build a sense of community amongst the students themselves and the department in general. This will be pursued in the upcoming year. (b) We agree that finding ways to celebrate student successes is a great idea and will implement some of the suggestions in the upcoming year. (c) We agree that the “hotel” model for student office space is a major concern for students and faculty and must be reconsidered. It will only lead to further erosion of a sense of “home” for students. The department, however, has little if any control over this and thus needs the attention of senior administrators in the College. (d) We were pleased to hear that complaints of systemic discrimination were likely restricted to a few disgruntled former students.

5. Faculty profile. As noted above, the aging faculty profile is a very serious issue and faculty renewal should start immediately.

6. Administration. (a) There is uncertainty as to what impact the merger of the Biochemistry and Microbiology & Immunology departments will have on the administrative load of the graduate secretary. This will be closely monitored by the two graduate chairs and the department head. (b) We agree that given the strength of the Biochemistry graduate programs, that they should be maintained separate from those of the Microbiology & Immunology department. Any future consideration of merging the graduate programs will be done with great care and attention, and should only be pursued if clear and tangible benefits can be identified.
SUMMARY ASSESSMENT - MICROBIOLOGY AND IMMUNOLOGY

Does this program, as it is resourced, meet the expectations of quality as compared to other similar programs delivered at other institutes across Canada?

☒ Meets the expectations for a quality graduate program

What did you find most commendable about the program (maximum two)?

1. **High caliber junior faculty**: The department has attracted and retained several high caliber junior faculty members over the last 10 years who continue to receive funding from several national agencies. These faculty are actively training graduate students and are contributing new expertise to the department.

2. **Impressive science** is being done by these scientists and their trainees despite the fairly modest facilities available to them.

What, if any, enhancements would you recommend at this time (maximum two)?

1. Continue to **rejuvenate the faculty**, increase research income and graduate student numbers

2. Enhance **graduate student program cohesiveness** (exams, scheduling of meetings, clear articulation of expectations, timeliness of programs) and strengthen pipeline to attract undergraduates into graduate programs

Would you recommend that students apply to this program? Would you considering hiring, recommending, or recruiting one of its graduates to your academic or research unit?

Yes. The best students from the department would be competitive in the field, nationally and internationally.

REVIEWERS

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<tr>
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<tr>
<td>Sabine Banniza (University of Saskatchewan)</td>
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<td>Tom Hobman (University of Alberta)</td>
<td>April 26, 2018</td>
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<td>Alice Telesnitsky (University of Michigan)</td>
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1. Program Objectives and Curriculum

1.1 Do the program objectives and the program curriculum meet the expectations of the discipline in terms of breadth, depth of coverage and interdisciplinary nature; currency of content and theory; research design and analysis (where appropriate)? To what extent does the curriculum demonstrate innovation and creativity in program design?

We don’t think so. The program purports to offer graduate studies in four general areas: Diagnosis, Epidemiology and Pathogenesis of Infectious Disease, Immunology/Virology, Molecular Genetics/Microbial Physiology and Tumor Biology/Immunology. With only 7-8 faculty members with active research programs it does not seem feasible to maintain cutting edge expertise in all of these areas. It would be better to recruit strategically and align with other microbiology/immunology strengths on the U of S campus (Veterinary College and VIDO) to develop true areas of strength.

1.2 Is the curriculum effective in content and/or delivery? Are courses sequenced and offered such that students are able to complete their programs in a timely manner? Does the program offer opportunities for meaningful specialization within the discipline?

Courses are currently taken within the first 18 months but appear to be selected based on availability rather than the specific needs of a student or his/her program. In general, the curriculum is strong but has an obvious gap in statistics/bioinformatics/big data management, which will be of increasing importance with the ubiquity of growing data sets. This has been recognized by the department, but it is not clear how the gap will be filled.

1.3 Does the program engage in a breadth and depth of interdisciplinary collaboration that stimulates the intellectual development of students and program faculty?

Considering expertise in the field is dispersed across Colleges and VIDO, better integration of the personnel, resources and facilities available on campus could build synergy and create a unique and exciting environment for graduate training in microbiology and immunology. Faculty are certainly aware of this (in part through associate appointments in other departments), but other than participation in a seminar series, students do not appear to have regular interactions with faculty members from these other programs.

1.4 Are the degree requirements appropriate in the academic context of the discipline and/or the expectations of the profession?

Yes

1.5 Are students engaged in various activities to develop and demonstrate learning (e.g. experiential learning, practica, field experiences, internships), where appropriate?

Travel grants are available to students to attend conferences and they are encouraged to do so as evidenced by the 11 to 18 conference presentations per year. Other such opportunities appear to have not been tapped into and students primarily learn in their research groups and through their course work.

1.6 Are the student learning outcomes (SLOs), knowledge and attributes for the program clearly articulated (e.g. conceptual and critical thinking, research skills and methodologies, specific skills and abilities central to the discipline, ethics, written and oral language abilities)?

Students were somewhat unsure what the expectations (e.g. manuscripts, conference papers) were in their
programs. Nonetheless, the publication records for several of the research groups appears to be strong so we are left to conclude that there is an implied expectation by supervisors in some groups.

1.7 Are the SLOs evaluated in a manner that is effective and representative of the progressive learning outcome expectations between Masters’ and PhD programs?

The program descriptions of both degrees only differ in admission standards and degree requirements. Students in both programs have to provide annual progress reports to their advisory committees through which SLOs are assessed. MSc students transitioning into a PhD program must pass a qualifying exam after 18 months that requires the critical reading of selected manuscripts and answering questions either orally or both orally and in writing. PhD students undergo an additional comprehensive exam, usually administered towards the end of the degree. Both examinations evaluate SLOs, but comprehensive exams elsewhere are considered candidacy exams and are scheduled in the first trimester of a PhD degree. PhD stream students may be better served by a qualifying/candidacy exam earlier in the program (in 3rd year for example) rather than having to pass two separate exams.

2. Program Enrolment and Student Funding

2.1 Is the quality of the applicants regarding admission averages; proportion of students with national scholarships acceptable? Is the unit making decisions that are consistent with attracting students of promise?

Students admitted to the program often have averages below 80% and thus do not qualify for a number of internal awards such as the Dean’s Scholarship and devolved scholarships. It was felt that the expansion of the medical school from 50 to 100 seats and lowering of the average to 78% for entry has diverted students away from M&I, and the success rate of attracting students from the U of S M&I undergraduate degree has decreased. Furthermore, the majority of students in the graduate program are international students and thus do not qualify for national scholarships. Faculty members felt that students with a 78-79% average are still of high quality, but their ineligibility for scholarships complicated securing financial support for them. It will be imperative to explore other avenues to ensure adequate and secure financial support for desirable students who do not meet the minimum 80% average for internal scholarship programs.

2.2 Does this program have a national reputation as a high quality program that attracts students from outside Saskatchewan or from outside of Canada?

The interest in the program from outside the country appears to be strong, but faculty struggle to attract national and U of S undergraduate students into the graduate program. While the program is rigorous in nature, it would not be considered in the top 5 programs of its nature in Canada. Unfortunately, many of the local undergraduate and MSc students transfer into professional colleges, possibly because they are unaware of the diverse career opportunities for microbiology and immunology PhDs inside and outside of academia. Strengthening undergraduate and graduate interactions and including undergrad students in upcoming seminar series in which alumni are invited back to speak about their career paths and successes may attract more local students into the PhD program.

2.3 What is your assessment of the level of graduate student support from external awards? Is it what you would expect given the scope and profile of the program?

It is below average, in part because of the difficulty to attract students with above 80% averages, and because the majority of students are international students who are not eligible for national scholarships. Furthermore, the rule of not admitting international students directly into PhD programs has prevented admission of students with international scholarships in some cases.
2.4 Is the level of student funding available through internal scholarships, awards and teaching fellowships and other sources within the norm of what is available to comparable programs at other institutions?

Yes, at present, adequate funding appears to be in place for the duration of graduate programs, but concerns were raised that impending changes in department-specific funding may jeopardize this in the near future.

3. Student Outcomes

3.1 Are the learning outcomes for the graduate degrees in the program clearly identified and comparable to other similar graduate programs?

No. At least not to the review committee. Moreover, based on our discussions with representative graduate students in this program, there is significant confusion among the trainees as well. For example, major outcomes of graduate research are publications and conference presentations. Neither we nor the students were clear as to whether first or co-author publications are a requirement or expectation for a PhD or MSc degree.

3.2 Are the student outcomes assessed regularly and effectively, with evidence that the outcome assessment is being used to inform changes or enhancements to the program?

No. Students are required to have yearly supervisory committee meetings however, these meetings do not seem to adequately fulfill their intended purposes. For example, some students expressed uncertainty and angst about moving goal posts that would extend their programs. Again, this relates back to lack of clarity with respect to expected outcomes.

3.3 Are completion rates and times reasonable in light of national or international standards?

For PhD programs yes, but MSc completion times (~35-36 months average based on last 5 years) is too long. One would expect average time of no more than 30 months to complete a MSc program.

3.4 Are the percentages of students who withdraw from the program reasonable in light of national or international standards?

No concerns.

3.5 Is the quantity and quality of student publications, presentations and awards reflective of a top quality program? Are student’s works published in peer-reviewed journals and conference proceedings.

The review committee was not provided with a separate list of student publications and without student names, it was not possible to cross reference this information from the faculty CVs of which we received only 8 of 13 faculty members. However, the aggregate total publications indicated in Table 3.4 of the Self-Study Report suggest strong productivity from the faculty of this department. But, without doing extensive Pubmed searching, it is not possible to assess the quality of student publications. We suggest that a list of student publications be provided for subsequent reviews.

3.6 Are graduates from the program successful in gaining entry into advanced graduate study (doctoral study, postdoctoral fellows, research in industry, or research institutes), entering academia, being licensed to practice or accredited for service? (whichever is discipline appropriate)

The committee felt that the information provided in Table 3.6 of the Self-Study Report was not sufficient.
to understand how many MSc student applied to PhD programs but rather, only those that were admitted to PhD programs. Furthermore, the response rate (<25%) of the alumni (Table 3.7) is too low to gauge how successful graduates were in the work place.

3.7. Are the employment prospects in the areas of concentration [Microbiology and Immunology] and emphasis on this program the same, better or worse than those of comparable programs?

Because of the relation to health, agriculture, biotech, government and funding administration, the employment prospects for Microbiology and Immunology graduates is very high. This should be stressed to incoming graduate students and senior undergraduate students to retain and attract talent in this discipline.

3.8. Is the level of student satisfaction with their graduate experience and learning outcomes reflective of a quality program and a quality educational experience?

There is definitely room for improvement in this area. While the representative students were very proud of their association with the Microbiology and Immunology program, there was a palpable lack of social engagement among the trainees and faculty. This could be improved by providing regular and structured venues to facilitate more interaction between students and faculty and just as importantly, among trainees themselves.

4. Learning Environment

4.1 Are students adequately prepared and mentored in the development of critical thinking and research skills, and teaching and supervisory skills? Are there sufficient opportunities for knowledge transfer and are students participating in these activities to a high degree?

Unclear. The review committee is under the impression that this type of evaluation normally occurs during qualifying exams. However, based on student responses, it was unclear whether or not this is the case at U of S. Coupled with the fact that the comprehensive exam often occurs late in the program, the ability to assess students’ critical thinking at an early stage may be lacking. All students mentioned positive experiences in TAing.

4.2 Is there an appropriate ratio of students to active graduate faculty?

Yes. Based on the information provided to us, the department has ~20 graduate students and 7 highly active research faculty. The ratio of 3 students/faculty member seems like a healthy ratio. Please note that our assessment of the faculty members research programs was based on the 8 faculty CVs that we had access to.

4.3 What is the quality of supervision students receive from their supervisor and advisory committee? Is there sufficient evidence for appropriate oversight of graduate student mentoring and scholarly and creative activities?

While the students appreciated the ability to approach and interact with their supervisors and committee members, on a variety of topics, the expectations with respect to publications, supervisory committee meetings and completion timelines were not clear to the students that we met with. In fact, there was a notable collective frustration among the students in this regard.

4.4 How accessible and effective are the information tools (website, graduate handbook, etc.) used by the program to inform students?

Again students were confused about these issues even though much of the information is readily available
on the department website. Some of these gaps may be related to the fact that the department shares a Graduate Secretary with other departments and furthermore, this person is new in the role. Also, we were initially concerned by the fact the Graduate Chair (Sylvia) spends most of her time at VIDO however, the students were adamant that they had ready access to her and that this geographical situation was not viewed as a negative.

4.5 Do the students and faculty have access to appropriate learning and information resources such as library resources, computers, classroom equipment and laboratory facilities?

Yes except that students were very concerned about losing their “permanent” desk space. The review committee shares these concerns and challenged the students to provide alternative solutions. They responded by suggesting smaller desks and more students per office is one possible solution.

4.6 How effective are the steps being taken to improve instruction based on regular and appropriate evaluation of graduate course instruction?

We were not provided with sufficient information to answer this question.

5. Faculty Profile

5.1 Is the level of overall faculty scholarship and creative productivity within the norms for a program of this size and scope, with respect to both the quantity and quality of the work?

No. The department includes some very productive junior to mid-career investigators. However, overall, they are underachieving as a department and fall below the norms for a program of this size and scope. It appears that some members of the department are on subsistence funding. Presently, there is not enough funding to allow research expansion in the department.

5.2 Are the faculty sufficiently engaged in research, scholarship or artistic work such that the environment created enables high quality theses and dissertations?

No. A number of faculty are very active in research, but this does not seem to translate into a vibrant and exciting atmosphere in the department. The students appreciate the approachability and informal nature of faculty-student interactions, but the students convey that they are not adequately challenged and scientific passion is uneven but overall seems low.

5.3 Is the majority of graduate teaching and supervising of graduate students being done by faculty with active and productive research programs?

Yes. Because of the linkage of funding with admission, most graduate students are engaged in active and productive labs.

5.4 Is there integration between scholarship and teaching? Does faculty bring their scholarship to their graduate teaching and mentorship?

Most of the graduate courses taught in the department are essentially dual undergraduate/graduate courses. As such, graduate students who attended the U of S as undergrads took departmental offerings as undergrads and therefore do not enroll in M&I graduate courses for the most part. In this sense, teaching and scholarship are separated, but this is fairly standard for a Canadian system.

5.5 Is the number of faculty members holding grants proportionate to the averages of other units in the discipline in competitive awards?

Quality Standards
☒ Meets
☐ Does Not Meet
No, this is due to the current demographics where about 40% of the faculty appear to be winding down their programs. This underscores the urgent need to recruit new research-intensive faculty.

**Active:**

Linda Chelico - CIHR funding
Joyce Wilson - CIHR funding
Silvia van den Hurk - NSERC funding, recent CIHR
Jo-Ann Dillon - recent CIHR funding NSERC
Wei Xiao - large NSERC grant, recent foundation support. Significant contributions to collaborations and solid contributions as corresponding author in signalling and FEBS journals.
Kerri Koblin: NSERC good recent papers (NAR, etc)
Sidney Hayes: low recent NSERC funding; smattering of first author virology papers—looks unlikely to renew

**Newly recruited:**

Kerry Lavender

5.6 Is the level of unit and/or faculty contribution to graduate student support reflective of discipline appropriate norms?

Yes, the well-funded faculty are devoting appropriate funds to graduate training.

6. Administration

6.1 Is the financial assistance package (scholarships, GTFs, GTAs) available to graduate students adequate?

Yes, students are currently supported through scholarships, GTFs and GTAs, as well as stipends paid from grants. Concerns were expressed that withdrawal of $87K for GTAs by the College will jeopardize the financial stability for graduate student support.

6.2 Are the operating procedures and structures of the unit sponsoring the program consistent with discipline appropriate norms?

We are not sure what information is being sought here and as such, are not able to provide an informed opinion.

6.3 Does the grad program engage, appropriate to the norms of the discipline, in a self-reflection on “where are we now” and in a planning effort on “where do we want to go” within the discipline?

We got the impression that the department is aware of its weak points and have put thought into strategies to change this. They recognize that a major impediment for further development will be the hiring of new faculty, which may or may not happen considering the financial situation of the university. They were less aware of how the department is perceived by the graduate students who thought that although faculty members were very approachable, the department as a whole did not feel like one unit. They thought that more social interactions as a group would be very good.
6.4 Is there concern with the number of problems or issues referred to the College of Graduate and Postdoctoral Studies?

The self-study document did not indicate any unusual problems and the drop-out number and causes appear to be within the norms of similar programs.

6.5 Are there sustained, effective and purposeful recruitment and admission efforts?

The department is very keen to increase the number of local students and has been engaging more with undergraduates through presentations on research programs, hiring undergraduate students as summer students, and establishing an undergraduate research project course. Regarding the latter, they are developing a third-year research-based course that will allow students to connect with the ongoing research in the department. Enhancing interactions with second-year students enrolled in a popular M & I course during their annual poster session also is encouraged.

6.6 Is there evidence that the unit sponsoring the program is dealing with program and students issues effectively and efficiently?

In general, yes. The six graduate students (out of 20 total) that attended the meeting with the review committee were happy to be in the department. However, contact with alumni appears to be weak considering the low response to the survey.

6.7 Is there evidence that the strategic vision of the program is aligned with the broader integrated planning environment at the university?

Yes, young and mid-career faculty have tri-council funding, they are keen to attract undergraduate students and the large cohort of international graduate students certainly contributes to the internationalisation of the university.
MEMORANDUM

TO: Dr. Sylvia van den Hurk – Graduate Chair, Microbiology and Immunology

CC: Dr. Jo-Ann Dillion – Department Head, Microbiology and Immunology
    Dr. David Cooper – Assistant Dean Graduate Studies, College of Medicine
    Dr. Preston Smith – Dean, College of Medicine

FROM: Dr. Trever Crowe – Interim Dean, College of Graduate and Postdoctoral Studies
    Dr. Tony Vannelli – Provost and Vice-President Academic

DATE: 29 October 2018

SUBJECT: Graduate Program Review of M.Sc. and Ph.D. in Microbiology and Immunology

The University of Saskatchewan is committed to being a major presence in graduate education and adhering to international standards in all that we do. Graduate Program Review is an important tool for measuring our success against those goals. We would like to take this opportunity to thank you and your colleagues for participating in this review process.

The reviewers stated that your program meets expectations for a quality graduate program. The Review Report provided evidence of program quality in several key areas, including:

- the Department’s success in attracting and retaining high quality junior faculty
- the “impressive science” being done by faculty and students

The Report also provides recommendations to help the program evolve and grow. These recommendations include:

- a need for faculty renewal
- a need for increased recruitment of undergraduate and M.Sc. students
- a need to clarify student expectations and enhance program cohesiveness

You have acknowledged the validity of these concerns and provided additional clarification where necessary. Several initiatives to improve the student experience were identified in your response to the review. You might consult with the Gwenna Moss Centre for Teaching and Learning to support your plans for curriculum enhancement. There may be mechanisms to support student recruitment, and we invite you to engage with the College of Graduate and Postdoctoral Studies on this topic. Consistent with targets set out in the University’s Strategic Enrolment Management plan, we expect that the Microbiology and Immunology program will support the College of Medicine’s efforts to increase graduate student enrolment. We encourage the College of Medicine to promptly respond to concerns about the general issue of space allocation for graduate students and research activity within the college.

Though the schedule has not been confirmed, it is likely that the next review of your program will take place in 2025-26. In advance of your next review, we anticipate that you will have systematically and strategically explored ways to incorporate the reviewers’ recommendations into the development of your program.

We encourage you to engage the College of Graduate and Postdoctoral Studies in your program improvement processes. The College is eager to support in the continued growth of your program. In
addition, you may be able to draw on financial support from the Curriculum Innovation Fund. The fund will provide matching contributions to unit investments in program enhancements. The fund is coordinated through the office of the Vice-Provost, Teaching, Learning and Student Experience.

In addition, you may be able to draw on financial support from funds coordinated by the Gwenna Moss Centre for Teaching and Learning. These funds include the Experiential Learning Fund, the Provost's Prize for Collaborative Teaching and Learning, and the Open Educational Resources Fund.

In closing, we would like to again thank you for your very effective engagement in the graduate program review process over the past year.

Sincerely,


Trever Crowe
Interim Dean, College of Graduate and Postdoctoral Studies


Tony Vannell
Provost and Vice-President Academic
Policies and Procedures

Graduate Programs in Biochemistry, Microbiology and Immunology.
University of Saskatchewan

September 2019
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1. Introduction

The Biochemistry, Microbiology and Immunology (BMI) Department offers both M.Sc. and Ph.D. degrees. The purpose of this manual is to provide additional information concerning these programs which may not be available on the College of Graduate and Postdoctoral studies (CGPS) web site (see https://www.usask.ca/cgps/policy-and-procedure/index.php) or the Departmental web site (https://medicine.usask.ca/department/schools-divisions/biomed/biochemistry,-microbiology-and-immunology.php).

2. Application and admission

Prospective students interested in BMI should learn about the department, its research activities, and the availability of opportunities by visiting its web site at: https://medicine.usask.ca/department/schools-divisions/biomed/biochemistry,-microbiology-and-immunology.php. This site also provides a list of “research-active” faculty.

[a] Eligibility:

*note: current CGPS minimum admission standards apply. The qualifications indicated below are being proposed for the 2021-2022 admission cycle. They indicate standards to be competitive.

M.Sc. admission requires an honours Baccalaureate (or equivalent) from a college or university of acceptable standing, and equivalent to the degree at this university with a specialization in BMI or a related discipline. A cumulative weighted average of at least 75% (U of S grade system equivalent) is the minimum standard. (Students with a lower average may be accepted under exceptional circumstances).

Ph.D. admission requires a Master’s degree, or equivalent, from a recognized university in an academic discipline relevant to the proposed field and a cumulative weighted average of at least 80% (U of S grade system equivalent) In order to assess the quality of the student’s M.Sc. degree the BMI Graduate Committee will review the thesis and any published papers. If the M.Sc. is not deemed to be equivalent, then the applicant must enroll as a M.Sc. student and take a Ph.D. qualifying exam within the first 2 years (see regulations for this below).

If English is not your native language, you must arrange for a certified result of the "Test of English as a Foreign Language" (TOEFL) or International English Learning Test Score (IELTS) to be sent directly to us. Note that our department requires a minimum score of 90 (TOEFL, with a minimum of 20 in each area) and 6.5 (IELTS, with a minimum of 6.5 in each area). For those who are unable to get access to TOEFL or IELTS exams, alternative English language exams recognized by the CGPS are acceptable. Please visit the above web site for more information https://grad.usask.ca/admissions/admission-requirements.php#11Englishlanguageproficiencyrequirements.

[b] How to apply:

1. If you intend to apply to the BMI graduate program, it is required that you first find a faculty member in our Department who will agree in advance to be your research supervisor (assuming that all other conditions are met). Please contact those individuals whose research you find interesting. Applications can be made at any time.

2. Once you have identified a faculty member who is willing to be your supervisor, you will have to formally apply to the graduate program through the CGPS. The graduate studies application fee is $90 CDN and is NOT refundable. Completion of CGPS’s online application form requires that original academic transcripts and formal proof of English proficiency be provided.

3. Once the BMI Department has recommended admission to CGPS, the CGPS will need to
approve the admission and issue an offer of admission before you can begin your studies.

Although students may apply to enter our graduate program at any time, the university calendar year begins in September and graduate classes are offered either in September (Term 1) or in January (Term 2). The first round of the Dean’s Scholarship is due on December 1st but in any event, complete applications for admission must be received by February 1 in order to be considered for scholarship funding beginning the following September. North American applicants should apply a minimum of 4 months prior to anticipated start date, while due to visa processing, international applicants should apply a minimum of 6 months prior to your anticipated start date.

3. Graduate program

[a] Minimum program requirements:

At the beginning of the program, the student in consultation with the supervisor will prepare a research proposal that will be submitted to the graduate advisory committee to assess its suitability (Guidelines attached). A new graduate student should have the first Advisory Committee meeting within four months after registration to establish a Program of Studies (POS) outlining the research, ethics requirements, course work, and committee members.

For both M.Sc. and Ph.D. programs the major requirement for continuation in the program is progress in all components. This includes progress in course work, research, written and oral presentation skills, and thesis writing. If, at any time, the supervisor, committee chair or any other member of the student’s advisory committee has reason to believe that progress is not satisfactory then a committee meeting should be called immediately to discuss and address the issue(s).

Course work: For the M.Sc. program the student must take 9 credit units consisting of graduate level (800) courses with a 70% cumulative grade point average, with no individual mark being below 60%. The committee may recommend additional courses at any level in order to bolster a student’s knowledge in perceived areas of weakness and/or to complement the research program.

For the Ph.D., no graduate level (800) courses are required. In some cases, additional courses may be recommended by the student’s committee to bolster a student’s knowledge in perceived areas of weakness and/or to complement the research program. (Note: It may be beneficial for students to take several 800 level courses to increase their chances of winning scholarships but a cumulative gpa of 80% is required with no individual mark being below 70%).

Graduate Student seminars: Graduate students are required to present one seminar each year on their research progress as part of a graduate seminar course (BMI990). Yearly registration and attendance in BMI990 is required throughout the graduate program.

Research progress: Progress in research will be assessed by the committee annually (usually in May) on the basis of a short but formal presentation and by submission of a progress report to the advisory committee at least one week before the scheduled committee meeting. The written report should contain a brief overview of relevant background, hypotheses, experimental methods, results and future plans. A list of
references is required. The report should include background, hypotheses, experimental methods, results and future plans. A list of references is required. The report should also include a list of courses completed and those remaining to be taken, and achievements (e.g., publications, conferences and awards) during the past year.

The students should address the questions raised in previous meeting(s) in their progress report. It is the responsibility of the supervisor to make sure that the questions previously raised have been addressed. (A section “issues to be addressed prior to next meeting” will be added to the minutes to help address this problem.)

Please remember to follow the guidelines (see attached). The report is not supposed to be a mini-thesis so the introduction should be brief (maximum 4 pages, 1.5 spacing). The committee is trying to assess the progress in the last year so it is helpful to start the results with a brief overview of the previous results. Please make it absolutely clear which are the new results.

The Progress report should be submitted to the supervisor in early April at least 3 weeks before the meeting date for a thorough review and suggested revisions should be made before it is submitted to the members of the committee at least 7 days before the meeting date. If the guidelines are not followed it will be returned to the student for revision and the meeting will be rescheduled. The main committee meeting will be held in May.

In addition, there will be a second, shorter meeting in November at which the student will again present a short talk and an addendum to the progress report (submitted by November 1st) which only describes progress in the last 6 months (maximum 2 pages, 1.5 spacing, + figures).

Presentation skills: Oral communication skills will be assessed on the basis of the talks to the committee as well as the formal presentations in journal club (BMI890 or equivalent). Written communication skills will be assessed on the quality of the initial proposal and the subsequent progress reports. If required, the committee should expect to see a significant improvement in both oral and written abilities as the student progresses through the program. (Note: Many language courses are available on campus particularly for foreign students and the advisory committee should recommend these when deficiencies are noted or difficulties are encountered. Information can be found at [https://students.usask.ca/international/#InternationalStudentandStudyAbroadCentre](https://students.usask.ca/international/#InternationalStudentandStudyAbroadCentre)

Student progress with respect to course requirements and other exams will be discussed during the meeting. At the end of the meeting, the student MAY be asked to leave the room for the Committee to discuss relevant issues. The Chair of the committee should provide a written report of the meeting to be sent to the Committee members for review, then the Graduate Secretary for data entry, submission to CGPS and filing. If necessary, the Chair may delegate a Committee member to take scientific minutes to be communicated to both Committee members and the student. The written minutes of the meeting will be made available to the Supervisor, Grad Chair and the graduate student through PAWS (online).

Thesis writing: (See attached guidelines and section [3f] below) In general, it should require between 3 to 4 months to write the thesis for MSc and PhD students respectively. Progress should be monitored initially by the supervisor with guidance from the committee if there are delays. Students should understand that the thesis must be approved, first by the supervisor, second by the advisory committee chair and finally by the committee before being sent to the external examiner. Each step takes time, usually a minimum of three weeks, and revisions may be required at each step. Even after the thesis defence, major revisions may be required. Therefore, PLEASE allow 3-4 months after submission of the thesis to the supervisor before
accepting another appointment or leaving the country!

When the student has finished or nearly finished his or her research, an Advisory Committee meeting will be held at which the student will present major experimental data to be included in the thesis along with a draft Abstract and Table of Contents to the committee members. The committee members will discuss the proposed thesis content and indicate their approval for the preparation of the thesis. This committee meeting will be independent of the student’s mandatory annual committee meeting, although it may take place concurrently. (If deemed reasonable the discussion can also take place by email). Three possible outcomes may arise from this meeting:

- The student is given unconditional permission to write thesis.
- The student is given permission to write thesis pending completion of certain set(s) of experimental data.
- The content is deemed insufficient for writing thesis and additional experimental data are required for the Committee to review the progress.

Once a student has begun writing the thesis, it is in the student’s as well as the department’s interest that the writing and defence proceed efficiently. Recognizing that the mode of interactions between supervisors and students varies considerably, the following guidelines are expected to be adhered to once a complete draft of the thesis is in the hands of the supervisor.

- Review of a first complete draft by the supervisor; four weeks.
- Review of a second complete draft by the Advisory Committee; three weeks.
- Review of a third draft by the Advisory Committee; two weeks (optional)
- Review by the External examiner; three weeks (M.Sc..) or six weeks (Ph.D.)

Students should take account of these timelines when planning the final preparation and defence of their thesis. For example, once the thesis draft is ready for submission to the Advisory Committee, the student can expect a time lag of a minimum of 3 + 2 + 4 weeks (a total of 8 to 10 weeks) before the date of the defence, the last three or four weeks being required for the reading of the thesis by the external examiner for M.Sc. and Ph.D. theses respectively.

[b] Duration;

In general, it is expected that a M.Sc. should be completed in 2.5 to 3 years. Extension beyond 5 years requires the permission of CGPS. For completion of a Ph.D. the time frame is longer, between 4.5 to 5.5 years. Extension beyond 6 years requires the permission of CGPS. Students can request a leave of absence due to health or compassionate reasons. It is important to make arrangements with your supervisor and chair of the advisory committee well in advance if possible. Leaves must be approved in accordance with CGPS policy.

[c] Teaching;

All students are encouraged to amass as much teaching experience as possible.
As part of the program, all students will be expected to demonstrate in one of the lab courses. This involves helping the undergraduates in the lab one afternoon/week as well as marking lab reports. There is a stipend for this work that is dictated by the PSAC collective agreement. All MSc students should have a minimum of one and PhD students a minimum of two TA experiences during their respective programs. A student can exceed this minimum level as long as there is mutual agreement between the supervisor and student.

In addition, the BMI Department offers several online courses in which graduate students may participate by acting as mentors and leading small-group discussions. (Refer to PSAC for the salary, but it is restricted to BMI students.)

It is expected that time spent teaching/demonstrating will not come at the expense of the student’s research.

[d] Transfer from M.Sc. to Ph.D.

Some students may seek permission from their supervisor and Advisory Committee to transfer from a M.Sc. program to a Ph.D. program before completing the requirements of the M.Sc. program, and without preparing and defending a M.Sc. thesis. This option is normally reserved for students who are doing very well in the M.Sc. program as demonstrated by a well-developed research project that can form the basis for a Ph.D. and who show great promise for success at the Ph.D. level as demonstrated by above average written and oral communication and demonstration of critical thinking skills. M.Sc. students who have completed at least 9 credits of graduate coursework, with a grade point average of 80% or higher with no mark below 70% may seek permission to transfer to the Ph.D. program as early as one year after entering the program but must do so before the end of their second year. M.Sc. students who have been in the program more than two years will not be permitted to transfer to the Ph.D. program. M.Sc. students must also pass a qualifying exam (see below). For the purpose of transferring, a student will not be permitted a second attempt at the qualifying exam. Transfers from the M.Sc. program to the Ph.D. program will be processed by CGPS once the student meets the eligibility requirements.

[e] Ph.D. qualifying exam;

The Ph.D. qualifying exam is an oral exam and is designed to test the student’s general scientific knowledge in two areas which are preselected by the supervisor and Advisory Committee.

The BMI Graduate Affairs committee will appoint two faculty members who are members of the advisory committee, the Graduate Affairs committee, or BMI faculty members, to be examiners. Each examiner will provide a short list, often 2-3 references (research article and/or review article) related to the subject, with a few sample questions to focus the students’ preparation for the oral examination. A minimum of 60 days will be provided for the scheduled exam date. The examination will take place three weeks after the student receives all references and sample questions. The examination questions will be related, but not limited, to the references provided. The purpose of the examination is to assess the student’s ability to synthesize scientific knowledge, to analyze the experimental data, and to apply the knowledge to critical thinking. The examination will be a maximum of 3 hours.

The examination Committee consists of the two subject examiners and the Chair of the advisory committee. After the oral examination is complete, the Committee will discuss and vote Pass or Fail on each subject. If a student fails one or both subjects, she/he may request a second examination which also requires permission of CGPS. The examination will take the
same format.

Please note that the student’s supervisor is not allowed to attend this exam. It is expected that time spent preparing for the exam will not come at the expense of the student’s research.

Once the student has passed the qualifying exam, he/she must submit a PhD program of study. A committee meeting including required new members must take place to approve the student’s Program of Study (POS).

[e] Ph.D. comprehensive exam;

All candidates for the Ph.D. degree are required to pass a comprehensive examination. This examination is usually on topics cognate to the candidate’s field of research and is used as a means of judging whether the individual has a mature and substantive grasp of the discipline as a whole. A comprehensive knowledge of the subject will not only help to validate the Ph.D. student as an expert in the general field of choice, but will also complement research activity in the specific area under investigation. Normally, the comprehensive exam should be held within 2-3 years of admission into the Ph.D. program or transfer from the M.Sc. program but before submission of a Table of Contents and formal “Permission to write” (see below). The comprehensive exam will be scheduled 60 days in advance and will consist of a written and oral examination conducted by the Advisory Committee. The student, in consultation with his/her supervisor, will choose from one of two formats:
1. Question based.
   Each Advisory Committee member will provide two questions related to the student’s research interest to the Committee Chair, who will assemble them into 8 questions and pass them on to the student. The student’s written response to each question (approximately 1 to 3 pages double-spaced per question) will be submitted to all the Committee members three weeks after receiving the questions and the oral examination will then take place one further week later.
2. Grant proposal.
   The Advisory Committee will decide a subject area related to the student’s research interest in consultation with the student. Once the subject has been approved, the student will have up to three weeks to prepare the proposal and distribute it to the Advisory Committee. The format of the grant proposal will be that required for NSERC as found on the current NSERC website, and comprised of the Summary of Research Proposal and Research Proposal sections (i.e. 10 pages double-spaced plus references and figures). The oral examination of the proposal will take place one week after it has been submitted to the Advisory Committee.

The oral examination involves all the Advisory Committee members and questions will be related, but not limited, to the written response or grant. After oral examination, the student will be asked to leave the room and the Advisory Committee members will discuss and vote for both written and oral components of the examination. Written comments on the examination may be provided to the student by the Chair. Candidates will be assessed on the oral and written components on a pass/fail basis.
Only upon successful completion of the comprehensive examination at an appropriate time during the program is a student permitted to continue scholarly activity towards the Ph.D. degree. The comprehensive examination may be repeated once with the permission of the Dean of CGPS. The results of all comprehensive examinations must be reported to the CGPS. A second failure will result in the student being required to withdraw from the program. This failure may be appealed to the Graduate Academic Affairs Committee on substantive or procedural grounds.

[f] Preparation and thesis defense. (See “Progress in thesis” for time line and guidelines);

When a student and his or her Supervisor believe that the research work is complete, the student must ask the Advisory Committee for permission to write a thesis. This request can be made at any time. A table of contents must be sent to the advisory committee for approval. The Advisory Committee must satisfy itself that the quantity and quality of the research is adequate, and that the student has a good grasp of his or her own work in relation to the existing knowledge base in the area of specialization. The Advisory Committee will either grant permission to stop research and concentrate on data analysis and thesis preparation, or specify additional research work that must be carried out.

Theses may be produced in either the traditional style or the ‘manuscript’ style, which consists of a manuscript, or cohesive series of manuscripts, written in a style suitable for publication in appropriate venues.

A final oral defense of the M.Sc. thesis will be conducted with an Examining Committee that includes the members of the Advisory Committee plus an External Examiner who is a member of another Department of the University, and who has not been a member of the student's Advisory Committee and is approved beforehand by the graduate chair. The Examining Committee for a M.Sc. defense will be chaired by the Chair of the Advisory Committee.

A final oral defense of the Ph.D. thesis will be conducted with an Examining Committee that includes the members of the Advisory Committee plus an External Examiner from outside the University and approved beforehand by the CGPS. A designate of the Dean of CGPS acts as Chair of the Examining Committee at a Ph.D. defense.

Both the M.Sc. and Ph.D. thesis defense are in the form of an oral examination, up to three hours in length. Immediately before the oral thesis defense, the student will present a 45 minute open seminar on the thesis work, to satisfy the final requirements for BMI 990. The seminar is followed by a closed question and answer defense of the thesis work.

4. Administration of the program
[a] Departmental Graduate committee;

The general functions of the Graduate Committee of the Department of BMI are to administer the graduate programs, to ensure that each graduate student fulfills the requirements necessary for an advanced degree in BMI, and to ensure that the standards of the Departmental graduate program are maintained.

[a] Supervisor:

The supervisor is the faculty member directly responsible for overseeing your research. The selection of a supervisor should be completed by mutual agreement among student, supervisor and the Department. The supervisor must be a faculty member of the CGPS and should be familiar with the rules and procedures of the department, the CGPS and those of the
university. Both student and supervisor are responsible for ensuring that all CGPS and departmental regulations and requirements are observed and met.

[b] Advisory committee;

The Advisory Committee for each graduate student functions to approve the Program of Study (course work and research program) as well as to ensure that the student satisfies all of the requirements of the Graduate Program in BMI. Major changes in the student’s program requires the approval of the Advisory Committee. The Advisory Committee also provides a source of information and counsel for graduate students. In this way, the graduate student will be exposed to a variety of opinions and ideas and can obtain help from individuals with particular expertise required for some aspect of the research project. Members of the Advisory Committee are also available for consultation concerning problems in situations where the student does not wish to approach their supervisor. If a conflict arises between the supervisor and the student, the supervisor should attempt first to resolve any problems informally with the student. If informal discussion does not lead to a resolution, then the Graduate Chair and advisory committee should be consulted. If this is not successful, then the Dean of Graduate and Postdoctoral Studies will be consulted. Similarly, if the student encounters problems then he/she should contact the chair of the advisory committee who will advise accordingly.

The Advisory Committee is composed of the Supervisor (and any Co-Supervisor), a Chair, and other faculty members of this or other departments, chosen by the Grad Chair and the Supervisor. The minimum number of members of a M.Sc. Advisory Committee is three. The minimum number of members of a Ph.D. Advisory Committee is five, including at least one member from another, cognate department. A Supervisor and a Co-Supervisor count as one member in terms of voting.

The Advisory Committees will meet regularly in May of each year to receive the Annual Progress Report from each graduate student. A second shorter meeting will also be required in November. The Advisory Committee may also meet at any other time at the request of the graduate student, the Supervisor, the Chair of the Advisory Committee, or the Chair of the Graduate Program Committee.

[c] Student/supervisor agreement;

See attached appendix.

5. Financing graduate school

[a] Sources of funding;

Supervisors are responsible for ensuring that each graduate student receives a stipend which meets a minimum departmental standard. Currently, departmental minimums are $19,000 per year for M.Sc. students and $24,000 per year for Ph.D. students. Termination of funding cannot be made unilaterally by the supervisor and requires a meeting of the advisory committee. In the absence of any scholarships or bursaries, this stipend will usually come from research grants held by the Supervisor. However, it is beneficial for both the student and the Supervisor if some or all of the support for the student is derived from scholarship or assistantship funds. Support from external sources generally provides a higher stipend than support from internal (University of Saskatchewan) sources. In particular, a student who wins a scholarship (e.g. CoMGrad, Sask. Innovation or federal funding) will have their minimum stipend increased as follows:

MSc. $19K + 50% of the non-matched portion of the award to a maximum of $29K.
Ph.D. $24K + 50% of the non-matched portion of the award to a maximum of $36K. For example: If a MSc. student gets a CoMGrad award (unmatched amount of $10K) then the stipend will increase to $24K of which the supervisor is responsible for $14K. i.e. both the student and supervisor benefit.

It should be noted that [a] these stipends are subject to the conditions of the award; for example, some fellowships cannot be held simultaneously, [b] devolved funds are not included and [c] stipends will revert to the base line if the fellowship is terminated.

Special case of CSC students.

The CSC PhD scholarship funding (currently $19,200/annum) requires the supervisor to pay the tuition of the student (in addition to topping up the salary to $24K as per departmental guidelines). Therefore, CSC students will be excluded from the 50% top-up stipend policy that is in place for other external scholarships.

Departmental Assistance.

The department awards scholarships in August, adjudicated by the chair of the Graduate Committee in consultation with the head. These scholarships are supported by devolved University Graduate Scholarship funds, devolved College of Medicine Graduate Scholarship funds, and departmental funds. Further information can be found in the appendix.

Financial assistance from the College of Medicine.

A limited number of Graduate Teaching Fellowships and Graduate Teaching Assistantships are awarded by the College of Medicine. Applications are submitted through the departmental Graduate Committee.

A limited number of Graduate Research Fellowships are awarded by the College of Medicine. Applications are submitted through the departmental Graduate Committee.

The Arthur Smyth Memorial Scholarship is available through the College of Medicine. These awards are intended for especially meritorious students who are nearing the end of a Ph.D. program. Applications are submitted through the departmental Graduate Program Committee.

CoMGrad scholarships are awarded biannually. Submission dates and application forms will be circulated to students when available.

Financial assistance available from the College of Graduate and Postdoctoral Studies

The CGPS offers the Dean's Scholarship for especially meritorious students. Preference is given to students entering the first year of a Ph.D. program, although entering M.Sc. students are also eligible. Applications are submitted through the departmental Graduate Program Committee.

From time to time, the CGPS announces the availability of Graduate Service Fellowships, which involve payment for various tasks or service within the University of Saskatchewan. Students who are receiving major support from other sources are ineligible, so it is unlikely that our graduate students will be able to take advantage of this program.
The Saskatchewan Innovation and Opportunity Graduate Scholarship is offered for graduate students conducting research in specific priority areas. Eligible current students will be invited to apply online. The department will also be invited to nominate a restricted number of external applicants each year. www.saskatchewan.ca/residents/education-and-learning/scholarships-bursaries-grants/scholarships/saskatchewan-innovation-and-opportunity-scholarship

Financial assistance available from external sources

A. National Science and Engineering Research Council (NSERC). Students may apply for M.Sc. or Ph.D. level awards to support their studies. Generally, students must be working in a NSERC-funded laboratory to be eligible for these awards. Application guidelines, materials and instructions are available at: http://www.nserc-crsng.gc.ca/Students-Etudiants/index_eng.asp (available to Canadian residents only)

B. Canadian Institutes for Health Research (CIHR). Students may apply for M.Sc. or Ph.D. level awards to support their studies. Generally, students must be working in a CIHR-funded laboratory to be eligible for these awards. Application guidelines, materials and instructions are available at (click 'funding opportunities'): http://www.cihr-irsc.gc.ca/e/37788.html (available to Canadian residents only)

C. A wide variety of additional internal and external awards are available, most of which are directed towards particular areas of study or particular categories of applicants. Students are strongly encouraged to explore the opportunities available. A comprehensive list of additional scholarship opportunities is maintained by the CGPS at: http://grad.usask.ca/awards/index.html

[b] Travel funds; Students are encouraged to go to conferences. Approximately $1500 may be available from the college and $350 (Canadian) or $550 (international) from the University at least once during the program.

BMI Graduate Application Checklist

___ Application Form Online at http://www.usask.ca/CGPS/applying/index.php

___ Three Recommenders - provide 3 email addresses into the online application

___ Curriculum vitae/résumé

___ Statement of research interest/research experience

___ $90 Canadian application fee paid on line

*Required, but sent separately*
___ Sealed, Official versions of all transcripts

___ Official English Test score (GSR English Language Requirement Information)

Please mail the completed application package to:

Graduate Programs
BMI
College of Medicine
University of Saskatchewan
2D01 HLTH, 107 Wiggins Road
Saskatoon, Saskatchewan, Canada
Consultation with the Registrar Form

This form is to be completed by the Registrar (or his/her designate) during an in-person consultation with the faculty member responsible for the proposal. Please consider the questions on this form prior to the meeting.

Section 1: New Degree / Diploma / Certificate Information or Renaming of Existing

1. Is this a new degree, diploma, or certificate? [ ] Yes [ ] No [X]  
2. Is an existing degree, diploma, or certificate being renamed? [ ] Yes [ ] No [X]  
   If you've answered NO to each of the previous two questions, please continue on to the next section.

3. What is the name of the new degree, diploma, or certificate?  

4. What is the credential of this new degree, diploma, or certificate? [Example - D.M.D. = Doctor of Dental Medicine]  

5. If you have renamed an existing degree, diploma, or certificate, what is the current name?  

6. Does this new or renamed degree / diploma / certificate require completion of degree level courses or non-degree level courses, thus implying the attainment of either a degree level or non-degree level standard of achievement? [ ] Yes [ ] No  

7. If this is a new degree level certificate, can a student take it at the same time as pursuing another degree level program? [ ] Yes [ ] No  

8. If YES, a student attribute will be created and used to track students who are in this certificate alongside another program. The attribute code will be:  

9. Which College is responsible for the awarding of this degree, diploma, or certificate?  

10. Is there more than one program to fulfill the requirements for this degree, diploma, or certificate? If yes, please list these programs.  

11. Are there any new majors, minors, or concentrations associated with this new degree / diploma / certificate? Please list the name(s) and whether it is a major, minor, or concentration, along with the sponsoring department. [ ] One major is required on all programs [4 characters for code and 30 characters for description]  

12. If this is a new graduate degree, is it thesis-based, course-based, or project-based?
Section 2: New / Revised Program for Existing or New Degree / Diploma / Certificate Information

1. Is this a new program?
   - Yes [ ] No [x] X
   - Is an existing program being revised?
   - Yes [ ] No [x] X
   If you've answered NO to each of the previous two questions, please continue on to the next section.

2. If YES, what degree, diploma, or certificate does this new/revised program meet requirements for?

3. What is the name of this new/revised program?

4. What other program(s) currently exist that will also meet the requirements for this same degree(s)?

5. What College/Department is the academic authority for this program?

6. Is this a replacement for a current program?
   - Yes [ ] No [x] X

7. If YES, will students in the current program complete that program or be grandfathered?

8. If this is a new graduate program, is it thesis-based, course-based, or project-based?
Section 3: Mobility

Mobility is the ability to move freely from one jurisdiction to another and to gain entry into an academic institution or to participate in a learning experience without undue obstacles or hindrances.

1 Does the proposed degree, program, major, minor, concentration, or course involve mobility?
   Yes ☐ No ☒
If yes, choose one of the following:
   - Domestic Mobility (both jurisdictions are within Canada)
   - International Mobility (one jurisdiction is outside of Canada)

2 Please indicate the mobility type (refer to Nomenclature for definitions).
   - Joint Program
   - Joint Degree
   - Dual Degree
   - Professional Internship Program
   - Faculty-Led Course Abroad
   - Term Abroad Program

3 The U of S enters into partnerships or agreements with external partners for the above mobility types in order to allow students collaborative opportunities for research, studies, or activities. Has an agreement been signed?
   Yes ☐ No ☐

4 Please state the full name of the agreement that the U of S is entering into.

5 What is the name of the external partner?

6 What is the jurisdiction for the external partner?
Section 4: New / Revised Major, Minor, or Concentration for Existing Degree Information (Undergraduate)

1. Is this a new or revised major, minor, or concentration attached to an existing degree program?  
   If you've answered NO, please continue on to the next section.  
   If YES, please specify whether it is a major, minor, or concentration. If it is more than one, please fill out a separate form for each.  
   [Yes] [No] [X] Revised [ ]

2. What is the name of this new / revised major, minor, or concentration?

3. Which department is the authority for this major, minor, or concentration?  
   If this is a cross-College relationship, please state the Jurisdictional College and the Adopting College.

4. Which current program(s), degree(s), and/or program type(s) is this new / revised major, minor, or concentration attached to?

Section 5: New / Revised Disciplinary Area for Existing Degree Information (Graduate)

1. Is this a new or revised disciplinary area attached to an existing graduate degree program?  
   If you've answered NO, please continue on to the next section.  
   If YES, what is the name of this new / revised disciplinary area?

   [Biochemistry, Microbiology and Immunology [BMMI - Bioch Micro Immuno - code and description for student system] [BMMJ]

2. Which Department / School is the authority for this new / revised disciplinary area?  
   (NOTE - if this disciplinary area is being offered by multiple departments see question below.)

   [Bioch Micro Immuno [BMMI] - currently exists in student system [BMMJ]

3. Which multiple Departments / Schools are the authority for this new / revised disciplinary area?

4a. Of the multiple Departments / Schools who are the authority for this new / revised disciplinary area and what allocation percentage is assigned to each?  
   (Note - must be whole numbers and must equal 100.)

4b. Of the multiple Departments / Schools who is the primary department? The primary department specifies which department / school policies will be followed in academic matters (e.g. late adds, re-read policies, or academic misconduct). If no department / school is considered the primary, please indicate that. (In normal circumstances, a department / school with a greater percentage of responsibility - see question above - will be designated the primary department.)

5. Which current program(s) and / or degree(s) is this new / revised disciplinary area attached to?

   [Master of Science-Thesis [MSC-T-GP], Doctor of Philosophy(Transfer) [PHD-TRANS-GP], Doctor of Philosophy [PHD-GP]
Section 6: New College / School / Center / Department or Renaming of Existing

1. Is this a new college, school, center, or department?
   - Yes
   - No [X]

2. Is an existing college, school, center, or department being renamed?
   - Yes
   - No [X]

3. Is an existing college, school, center, or department being deleted?
   - Yes
   - No [X]

   If you've answered NO to each of the previous two questions, please continue on to the next section.

2. What is the name of the new (or renamed or deleted) college, school, center, or department?

3. If you have renamed an existing college, school, center, or department, what is the current name?

4. What is the effective term of this new (renamed or deleted) college, school, center, or department?

5. Will any programs be created, changed, or moved to a new authority, removed, relabelled?

6. Will any courses be created, changed, or moved to a new authority, removed, relabelled?

7. Are there any ceremonial consequences for Convocation (i.e. New degree hood, adjustment to parchments, etc.)?
### Section 7: Course Information

1. Is there a new subject area(s) of course offering proposed for this new degree? If so, what is the subject area(s) and the suggested four (4) character abbreviation(s) to be used in course listings?

   | No |

2. If there is a new subject area(s) of offerings what College / Department is the academic authority for this new subject area?

   | |

3. Have the subject area identifier and course number(s) for new and revised courses been cleared by the Registrar?

   | Yes [ ] No [ ] |

4. Does the program timetable include standard class time slots, terms, and sessions?

   If NO, please describe.

   | Yes [ ] No [ ] |

5. Does this program, due to pedagogical reasons, require any special space or type or rooms?

   If YES, please describe.

   | Yes [ ] No [ ] |

NOTE: Please remember to submit a new "Course Creation Form" for every new course required for this new program / major. Attached completed "Course Creation Forms" to this document would be helpful.
Section 8: Admissions, Recruitment, and Quota Information - as per current set-up other than admission qualifications

1 Will students apply on-line? If not, how will they apply?

2 What term(s) can students be admitted to?

3 Does this impact enrollment?

4 How should Marketing and Student Recruitment handle initial inquiries about this proposal before official approval?

5 Can classes towards this program be taken at the same time as another program?

6 What is the application deadline?

7 What are the admission qualifications? (IE. High school transcript required, grade 12 standing, minimum average, any required courses, etc.)
   English proficiency requirement of minimum overall TOEFL score of 90 with a minimum of 20 in each area or a minimum overall IELTS score of 6.5 with a minimum of 6.5 in each area.
   Minimum average of 75% for Master of Science and 80% for Doctor of Philosophy.

8 What is the selection criteria? (IE. If only average then 100% weighting; if other factors such as interview, essay, etc. what is the weighting of each of these in the admission decision.)

9 What are the admission categories and admit types? (IE. High school students and transfer students or one group? Special admission? Aboriginal equity program?)

10 What is the application process? (IE. Online application and supplemental information (required checklist items) through the Admissions Office or sent to the College/Department?)

11 Who makes the admission decision? (IE. Admissions Office or College/Department/Other?)

12 Letter of acceptance - are there any special requirements for communication to newly admitted students?

13 Will the standard application fee apply?

14 Will all applicants be charged the fee or will current, active students be exempt?

15 Are international students admissible to this program?
Section 9: Government Loan Information - as per current set-up

NOTE: Federal / provincial government loan programs require students to be full-time in order to be eligible for funding. The University of Saskatchewan defines full-time as enrollment in a minimum of 9 credit units (operational) in the fall and/or winter term(s) depending on the length of the loan.

1. If this is a change to an existing program, will the program change have any impact on student loan eligibility?

2. If this is a new program, do you intend that students be eligible for student loans?

Section 10: Convocation Information (only for new degrees) - not applicable

1. Are there any 'ceremonial consequences' of this proposal (ie. New degree hood, special convocation, etc.)?

2. If YES, has the Office of the University Secretary been notified?

3. When is the first class expected to graduate?

4. What is the maximum number of students you anticipate/project will graduate per year (please consider the next 5-10 years)?

Section 11: Schedule of Implementation Information

1. What is the start term?
   - 202005 [May 2020] - for new majors
   - 202105 [May 2021] - for admission requirement change

2. Are students required to do anything prior to the above date (in addition to applying for admission)?
   - Yes ☐ No ☒
   - If YES, what and by what date?

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Section 12: Registration Information - as per current set-up

1. What year in program is appropriate for this program (NA or a numeric year)?
   (General rule - NA for programs and categories of students not working toward a degree level qualification.)
   
2. Will students register themselves?
   If YES, what priority group should they be in?

Section 13: Academic History Information - as per current set-up

1. Will instructors submit grades through self-serve?

2. Who will approve grades (Department Head, Assistant Dean, etc.)?

Section 14: T2202 Information (tax form) - as per current set-up

1. Should classes count towards T2202s?

Section 15: Awards Information

1. Will terms of reference for existing awards need to be amended?

2. If this is a new undergraduate program, will students in this program be eligible for College-specific awards?

Section 16: Government of Saskatchewan Graduate Retention (Tax) Program - as per current set-up

1. Will this program qualify for the Government of Saskatchewan graduate retention (tax) program?
   To qualify the program must meet the following requirements:
   - be equivalent to at least 6 months of full-time study, and
   - result in a certificate, diploma, or undergraduate degree.
Section 17: Program Termination

1. Is this a program termination? Yes [X] No [ ]
   If yes, what is the name of the program?
   Majors of Biochemistry [BIOC] and Microbiology and Immunology [MIIM] in the Post Graduate Diploma [PGD-GP], Master of Science-Thesis [MSC-T-GP], Doctor of Philosophy(Direct) [PHD-DIRECT-GP], Doctor of Philosophy(Transfer) [PHD-TRANS-GP], Doctor of Philosophy [PHD-GP] programs

2. What is the effective date of this termination? Yes [ ] No [X]
   202005 [May 2020]

3. Will there be any courses closed as a result of this termination? Yes [ ] No [X]
   If yes, what courses?

4. Are there currently any students enrolled in the program? Yes [X] No [ ]
   If yes, will they be able to complete the program?
   Students will be allowed to complete their current program or move to the new program

5. If not, what alternate arrangements are being made for these students?

6. When do you expect the last student to complete this program? Yes [ ] No [X]
   2025 - students have 6 years to complete

7. Is there mobility associated with this program termination? Yes [X] No [ ]
   If yes, please select one of the following mobility activity types.
   - Dual Degree Program
   - Joint Degree Program
   - Internship Abroad Program
   - Term Abroad Program
   - Taught Abroad Course
   - Student Exchange Program

   Partnership agreements, coordinated by the International Office, are signed for these types of mobility activities. Has the International Office been informed of this program termination? Yes [ ] No [ ]
Section 18: Proposed Tuition and Student Fees Information - as per current set-up

1 How will tuition be assessed?

- Standard Undergraduate per credit
- Standard Graduate per credit
- Standard Graduate per term
- Non standard per credit
- Non standard per term
- Other *
- Program Based *

* See attached documents for further details

2 If fees are per credit, do they conform to existing categories for per credit tuition? If YES, what category or rate?

3 If program based tuition, how will it be assessed? By credit unit? By term? Elsehow?

4 Does proponent’s proposal contain detailed information regarding requested tuition?
   Yes[ ] No[ ]
   If NO, please describe.

5 What is IPA’s recommendation regarding tuition assessment? When is it expected to receive approval?

6 IPA Additional comments?

7 Will students outside the program be allowed to take the classes?

8 If YES, what should they be assessed? (This is especially important for program based.)

9 Do standard student fee assessment criteria apply (full-time, part-time, on-campus versus off-campus)?

10 Do standard cancellation fee rules apply?

11 Are there any additional fees (e.g. materials, excursion)? If yes, see NOTE below.
   Yes[ ] No[ ]

12 Are you moving from one tuition code (TC) to another tuition code?
   If YES, from which tuition code to which tuition code?

13 Are international students admissible to the program? If yes, will they pay the international tuition differential?

NOTE: Please remember to submit a completed "Application for New Fee or Fee Change Form" for every new course with additional fees.
Section 19: TLSE - Information Dissemination (internal for TLSE use only)

1. Has TLSE, Marketing and Student Recruitment, been informed about this new / revised program?   
2. Has TLSE, Admissions, been informed about this new / revised program?   
3. Has TLSE, Student Finance and Awards, been informed about this new / revised program?   
4. Has CGPS been informed about this new / revised program?   
5. Has TLSE, Transfer Credit, been informed about any new / revised courses?   
6. Has ICT-Data Services been informed about this new or revised degree / program / major / minor / concentration?   
7. Has the Library been informed about this new / revised program?   
8. Has ISA been informed of the CIP code for new degree / program / major?   
9. Has Room Scheduling/Scheduling Hub/Senior Coordinator of Scheduling been informed of unique space requirements for the new courses and/or informed of program, course, college, and department changes?   
10. Has the Convocation Coordinator been notified of a new degree?   

11. What is the highest level of financial approval required for this submission? Check all that apply.
   a. None - as it has no financial implications
      OR
   b. Fee Review Committee
   c. Institutional Planning and Assessment (IPA)
   d. Provost's Committee on Integrated Planning (PCIP)
   e. Board of Governors
   f. Other

Signed:

Date: December 9, 2019

Registrar (Russell Isinger): Russell Isinger

College / Department Representative(s): Martha Smith

IPA Representative(s):