CGPS-NP-M.Sc.A.BiomedEng-NT_Trans_R00

New Program/Major or Minor/Concentration Proposal Form

(2017)

1.0 Degree Title
Please specify the two degrees for concurrent degree programs

Master of Science, Applied (M.Sc.A.)

1.1 Major (Legacy = Subject) (30-char. max.)

Biomedical Engineering

1.2 Concentration (Legacy = Concentration/Option)
If applicable to Majors only (30 char. max)

(Non-Thesis) Translational

1.3 Minor (with Concentration, if Applicable) (30char. max)

2.0 Administering Faculty/Unit

Graduate and Postdoctoral Studies (GPS)

Offering Faculty/Department

MD - Biomedical Engineering

3.0 Effective Term of Implementation
(Ex. Sept. 2004 = 200409)
Term

202009

4.0 Rationale and Admission Requirements for New Proposal

The focus of McGill's current graduate Thesis program in Biological and Biomedical Engineering is to prepare students for careers in research or academia. These research-intensive programs offer little training in the translational skills required to design, develop, manufacture, and commercialize biomedical devices and technologies. There is strong student interest in such training and a clear demand in industry for students with this expertise.

This professional Master's program expands on the existing Graduate Certificate in Translational Biomedical Engineering by increasing the range of technical and translational training, and by providing experiential training in the form of a 4-month Internship.

Admission Requirements: See last page. Entry allowed in Fall and Winter.

The departmental curriculum committee reviewed and approved this proposal in March 2019. [CONTINUED ON LAST PAGE]

5.0 Program Information

Please check appropriate box(es)

5.1 Program Type

- ☐ Bachelor's Program
- ☐ Master's
- ☒ M.Sc. (Applied) Program
- ☐ Dual Degree/Concurrent Program
- ☐ Certificate
- ☐ Diploma
- ☐ Graduate Certificate
- ☐ Graduate Diploma
- ☐ Ph.D. Program
- ☐ Doctorate Program (Other than Ph.D.)
- ☐ Private Program
- ☐ Off-Campus Program
- ☐ Distance Education Program (By Correspondence)
- ☐ Other:

Please specify

5.2 Category

- ☒ Faculty Program (FP)
- ☐ Major
- ☐ Joint Major
- ☐ Major Concentration (CON)
- ☐ Minor
- ☐ Minor Concentration (CON)
- ☐ Honours (HON)
- ☐ Joint Honours Component (HC)
- ☐ Internship/Co-op
- ☐ Thesis (T)
- ☒ Non-Thesis (N)
- ☐ Other:

Please specify

5.3 Level

- ☐ Undergraduate
- ☐ Dentistry/Law/Medicine
- ☐ Continuing Studies (Non-Credits)
- ☒ Masters & Grad Dip & Certs
- ☐ Doctorate
- ☐ Post-Graduate Medicine/ Dentistry
- ☐ Graduate Qualifying
- ☐ Postdoctoral Fellows

5.4 FQRSC (Research) Indicator
(For GPS)

☐ Yes ☒ No

5.5 Requires Resources
(financial, personnel, space)

☐ Yes ☒ No

6.0 Total Credits

45

7.0 Consultation with

Related Units	☒ Yes	☐ No
Financial Consult	☐ Yes	☒ No

Attach list of consultations.

8.0 Program Description (Maximum 150 words)

The M.Sc.(Applied) in Translational Biomedical Engineering; Non-Thesis program is a full-time specialized 13-month professional program in translational biomedical engineering. This is an intensive program that focuses on the biomedical engineering industry through a comprehensive curriculum covering essential skills and knowledge needed to translate biomedical engineering research into clinical and commercial solutions.

The program consists of three main components that are unique to the translational process in biomedical engineering, including: 1) translational courses on intellectual property, regulatory affairs, quality management systems, clinical trials, and reimbursement; 2) fundamental science courses in biomedical engineering; and 3) an experiential component, comprising of a closely supervised 4-month internship in the biomedical engineering industry.

None of the courses taken in the graduate certificate in Translational Biomedical Engineering can be credited towards the M.Sc (Applied) program once the graduate certificate has been completed.

9.0 List of proposed program for the New Program/Major or Minor/Concentration

If new concentration (option) of existing Major/Minor (program), please attach a program layout (list of courses) of existing Major/Minor.

Proposed program (list course as follow: Subj Code/Crse Num, Title, Credit weight, under the heading of: Required Courses, Complementary Courses, and Elective Courses).

M.Sc.(Applied) in Translational Biomedical Engineering; Non-Thesis (45 Cr)

Required Courses (30 Cr)
BMDE 653 Patents in Biomedical Engineering (3 cr)
BMDE 654 Biomedical Regulatory Affairs - Medical Devices (3 cr)
BMDE 655 Biomedical Clinical Trials – Medical Devices (3 cr)
BMDE 656 Medical Device Reimbursement (3 cr)
BMDE 657D1/D2 Biomedical Engineering Industry Internship (18 cr)

Complementary Courses (15 Cr)
15 credits to be chosen from courses listed below, or other relevant 500-, 600- or 700-level courses chosen in consultation and with approval of the Program Director and the concerned offering unit/department.

General Biomedical Engineering
BMDE 501 Selected Topics in Biomedical Engineering (3 cr)
BMDE 600D1/D2 Seminars in Biomedical Engineering (3 cr)

Biomedical Signals and Systems
BMDE 502 BME Modelling and Identification (3 cr)
BMDE 503 Biomedical Instrumentation (3 cr)
BMDE 512 Finite-Element Modelling in Biomedical Engineering (3 cr)
BMDE 519 Biomedical Signals and Systems (3 cr)

Medical Imaging
BMDE 610 Functional Neuroimaging Fusion (3 cr)
BMDE 650 Advanced Medical Imaging (3 cr)
BMDE 660 Advanced MR Imaging and Spectroscopy of the Brain (3 cr)
MDPH 607 Medical Imaging (3 cr)

Biomaterials and Tissue Engineering
BMDE 504 Biomaterials and Bioperformance (3 cr)
BMDE 505 Cell and Tissue Engineering (3 cr)

Biosensors and Devices
BMDE 503 Biomedical Instrumentation (3 cr)
BMDE 508 Introduction to Micro and Nano-Bioengineering (3 cr)

Rehab Engineering
BMDE 525D1/D2 Design of Assistive Technologies: Principles and Praxis (6 cr)

10.0 Approvals

Routing Sequence	Name	Signature	Date
Department	David Juncker		26.2.2019
Curric/Acad Committee	DAVID RAGSDALE		1 APRIL 2019
Faculty 1	AIMEE RYAN		8 APRIL, 2019
Faculty 2			
Faculty 3			
CGPS			
SCTP			
APC			
Senate			

Submitted By

Name		To be completed by ARR:	
Phone		CIP Code	
Email			
Submission Date	Click here to enter a date.		

Admission requirements:

Students with an undergraduate engineering degree with a major or minor in biomedical engineering, or the equivalent, and an undergraduate GPA of at least 3.0 out of a possible 4.0, or a GPA of 3.2 out of 4.0 in the last two years of full-time studies.

Graduates from other areas of engineering may be admitted provided they have backgrounds in Physiology equivalent to both PHGY 209 and PHGY 210. Applicants lacking the required Physiology background may be admitted but must fulfill the prerequisites in the first year of the program. This may be achieved by taking PHGY 209 and/or PHGY 210, and/or other courses approved by the Program Director. Prerequisite courses will not count toward the program's 45 credits.

Graduates with other backgrounds may be admitted provided they have the Physiology prerequisites (PHGY 209 & PHGY 210), at least two university-level Math courses, four university-level physical science courses, and one university-level programming course. Applicants lacking the required background may be admitted but must fulfill the prerequisites in the first year of the program. This may be achieved by taking courses approved by the Program Director. Prerequisite courses will not count toward the program's 45 credits.

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: March 18, 2019

TO: Dr. Laurent Mydlarski,
Associate Dean (Academic Programs) – Faculty of Engineering
Associate Professor – Department of Mechanical Engineering

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal. Specifically, a course [or courses] taught by your department that has [have] been included in the program's list of courses.

_____	**NO OBJECTIONS**	**X**	**SOME OBJECTIONS**

COMMENTS:

The Faculty of Engineering endorses the proposed Master of Translational Biomedical Engineering. However, it would have preferred that it not be developed without the input of the Department of Bioengineering, with which the Department of Biomedical Engineering shares graduate programs. There would have been an opportunity to build upon this collaboration by creating a translational medicine stream within the existing Biological & Biomedical Engineering graduate programs. A parallel program, such as the proposed one, may lead to confusion on the part of applicants.

Signature: _____

Date: **March 27, 2019**

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: January 29, 2019

TO: Meyer Nahon,
Chair – Department of Mechanical Engineering
Professor – Department of Mechanical Engineering

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal.

X **NO OBJECTIONS** _____ **SOME OBJECTIONS**

COMMENTS:

Signature: 

Date: **Feb 26, 2019**

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: January 27, 2019

TO: Dr. Jan Seuntjens,
Director – Medical Physics Unit
Professor – Department of Oncology, Medical Physics Unit

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

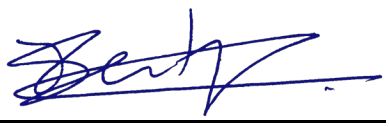
The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal. Specifically, a course [or courses] taught by your department that has [have] been included in the program's list of courses.

X **NO OBJECTIONS** _____ **SOME OBJECTIONS**

COMMENTS:
The program would also be useful to McGill Medical Physics M.Sc. graduates and it would be good if this could be explicitly mentioned in the Admission Requirements.

Signature: 

Date: **Feb 26, 2019**

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: January 27, 2019

TO: Dr. John White,
Chair – Department of Physiology
Professor – Department of Physiology

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal. Specifically, a course [or courses] taught by your department that has [have] been included in the program's list of courses.

__x__ **NO OBJECTIONS** **_____** **SOME OBJECTIONS**

COMMENTS:

The course requirements as listed are essentially BMDE courses and focus heavily on technology development. While this is generally OK, it is not clear what types of students the program expects to attract and what efforts will be made to accommodate students with strong backgrounds in engineering or physics (for example) but who are weak in biomedical sciences. It also might be a good idea to have clear subspecialties or streams within the program so that students can specialize in specific areas, possibly in collaboration with specific industry partners.

Finally, it is not clear why the students need 12 credits-worth of courses on regulatory affairs and clinical trials (BMDE653-656). This seems excessive as I would guess that a lot of it could probably be learned on the job. This has certainly been the case with some of my graduates who have transitioned from basic biomedical sciences to managing clinical trials or writing patents, for example.

Signature: 

Date: **01/29/2019**

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: January 27, 2019

TO: Dr. Dan Nicolau,
Chair – Department of Bioengineering
Professor – Department of Bioengineering

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal.

_____ **NO OBJECTIONS** **X** **SOME OBJECTIONS**

COMMENTS:

We do not have any substantial Objections regarding the content of the Master program as proposed. Also, and similarly with the previous Graduate Certificate in Translational Biomedical Engineering, we fully understand and respect the desire of the Department of Biomedical Engineering to find development paths that are independent from the common Biological & Biomedical Engineering Graduate Program. These being said, we feel that the existence of graduate programs by either Biomedical Engineering (and Bioengineering) outside BBME creates administrative confusion, it is against the general agreements we had at the BBME creation, and possibly it makes BBME unsustainable.

We wish all the luck of your application.

Signature: _____

Date: **24,2,2019**

APPENDIX 1

CONSULTATION REPORT FORM
RE PROGRAM PROPOSALS

DATE: January 27, 2019

TO: Dr. Viviane Yargeau,
Chair – Department of Chemical Engineering
Professor – Department of Chemical Engineering

FROM: Dr. Ahmad Haidar
Assistant Professor - Department of Biomedical Engineering
Program Director - Graduate Certificate in Translational Biomedical Engineering

The attached proposal has been submitted to the Curriculum Committee, and it has been decided that your department should be consulted.

Program Title: Master of Translational Biomedical Engineering

Would you be good enough to review this proposal and let me know as soon as possible, on this form, whether or not your department has any objections to, or comments regarding, the proposal.

X **NO OBJECTIONS** _____ **SOME OBJECTIONS**

COMMENTS:

Signature: _____

Date: **January 29, 2019**