



**502nd REPORT OF THE ACADEMIC POLICY COMMITTEE TO SENATE
on the APC meeting held on December 10th, 2020 – Part A**

I. TO BE APPROVED BY SENATE

(A) NEW TEACHING PROGRAMS REQUIRING SENATE APPROVAL

Faculty of Engineering

Joint B.Eng. in Global Engineering (120-128 cr.), with CentraleSupélec France– *appendix A*

At a meeting on December 10th, 2020, APC reviewed and approved a proposal from the Faculty of Engineering to create a new B.Eng. in Global Engineering. This new program has been designed and will be offered jointly with CentraleSupélec (France), a peer institution that is part of Paris-Saclay University and has a long-standing reputation for providing excellent training in General Engineering. The aim of this new Bachelor of Engineering is to train engineers who will be able to work in collaborative and interdisciplinary teams, in global settings. For that reason, students will spend the first two years of the program in France before coming back to McGill University for the last two years. Students will gain a strong scientific and technical knowledge and have the opportunity to specialize in one of the nine streams offered. In addition, students will also acquire soft skills, with the program putting the emphasis on languages and business management. If approved by Senate, this program will require external approval and be sent to the *Bureau de Coopération Interuniversitaire (BCI)* for review.

Be it resolved that Senate approve the creation of the proposed Joint B.Eng. in Global Engineering (120-128 cr.) with CentraleSupélec France.

(B) ACADEMIC PERFORMANCE ISSUES / POLICIES / GOVERNANCE/AWARDS – *none*

(C) CREATION OF NEW UNITS / NAME CHANGES / REPORTING CHANGES

Faculty of Engineering

Proposal to rename the Department of Civil Engineering and Applied Mechanics to the Department of Civil Engineering – *appendix B*

At a meeting on December 10th, 2020, APC reviewed and approved a proposal from the Faculty of Engineering to rename the Department of Civil Engineering and Applied Mechanics, which will become the Department of Civil Engineering. This change will more accurately reflect the scope of the teaching and research activities conducted by the Faculty members, whose expertise now include many sub-disciplines of Civil Engineering, such as Structural, Environmental, or Water Resource Engineering, amongst others. The new name will also align with the title of the undergraduate degree issued by the Department (B.Eng. in Civil Engineering) and therefore reduce the confusion that this discrepancy sometimes generates.

Be it resolved that Senate approve and recommend to the Board of Governors for approval the renaming of the Department of Civil Engineering and Applied Mechanics to Department of Civil Engineering.

(D) CHANGES IN DEGREE DESIGNATION – *none*

(E) INTER-UNIVERSITY PARTNERSHIPS – *none*

(F) OTHER - *none*

II. **TO BE ENDORSED BY SENATE / PRESENTED TO SENATE FOR DISCUSSION** – *none*

III. **APPROVED BY APC IN THE NAME OF SENATE**

(A) DEFINITIONS – *none*

(B) STUDENT EXCHANGE PARTNERSHIPS / CONTRACTS / INTERUNIVERSITY PARTNERSHIPS - *none*

(C) OTHER – *none*

IV. **FOR THE INFORMATION OF SENATE**

A) ACADEMIC UNIT REVIEWS - *none*

B) APPROVAL OF COURSES AND TEACHING PROGRAMS

1. Programs

a) APC Approvals (new options/concentrations and major revisions to existing programs)

i. New Programs

Graduate and Postdoctoral Studies

Faculty of Medicine and Health Science

M.Sc. in Experimental Medicine; Digital Health Innovation (45 cr.)

M.Sc. in Experimental Surgery; Digital Health Innovation (45 cr.)

At a meeting on December 10th, 2020, APC reviewed and approved a proposal to create a new concentration in Digital Health Innovation in the existing M.Sc. in Experimental Medicine and the M.Sc. in Experimental Surgery. This unique concentration will respond to a growing demand for skilled professionals who are able to use and generate digitized health and social data.

ii. Major Revisions of Existing Programs

Approved by SCTP on November 19th, 2020 and reported to APC on December 10th, 2020

Graduate and Postdoctoral Studies

Desautels Faculty of Management

M.B.A. (Japan); Non-Thesis – General Management (48 cr.)

Desautels Faculty of Management and Faculty of Law

Joint M.B.A.; Non-Thesis – General Management and B.C.L./J.D. (132 cr.)

Desautels Faculty of Management

B.Com.; Major in Managing for Sustainability (66 cr.)

b) APC Subcommittee on Courses and Teaching Programs (SCTP) Approvals
(Summary Reports: <http://www.mcgill.ca/sctp/documents/>)

i. Moderate and Minor Program Revisions

Approved by SCTP on November 5th, 2020 and reported to APC on December 10th, 2020

School of Continuing Studies

Diploma in Management; General (30 cr.)

Faculty of Engineering

B.Eng. in Bioengineering (142-152 cr.)

B.Eng. in Computer Engineering (133-137 cr.)

Graduate and Postdoctoral Studies

Desautels Faculty of Management

M.B.A.; Non-Thesis (54 cr.)

M.B.A.; Non-Thesis – General Management (48 cr.)

M.B.A. (Japan); Non-Thesis – Finance (57 cr.)

M.B.A. (Japan); Non-Thesis – General Management (57 cr.)

M.B.A. (Japan) ; Non-Thesis – Global Strategy and Leadership (57 cr.)

M.B.A. (Japan); Non-Thesis – Marketing (57 cr.)

M.B.A. (Japan) ; Non-Thesis – Technology an Innovation Management (57 cr.)

Faculty of Medicine and Health Sciences

M.Sc. in Medical Radiation Physics (45 cr.)

Approved by SCTP on November 19th, 2020 and reported to APC on December 10th, 2020

Faculty of Education

B.Ed. in Kindergarten and Elementary Pédagogie de l’Immersion Française (120 cr.)

B.Ed. in Kindergarten and Elementary Education; First Nations and Inuit Studies (120 cr.)

Certificate in Education for First Nations and Inuit (60 cr.)

Desautels Faculty of Management

B. Com.; Major in Statistics and Computer Science (72 cr.)

ii. Program Retirements

Approved by SCTP on November 5th, 2020 and reported to APC on December 10th, 2020

School of Continuing Studies

Professional Development Certificate in Back End Web Development (28 CEUs)

Professional Development Certificate in Front End Web Development (28 CEUs)

Approved by SCTP on November 19th, 2020 and reported to APC on December 10th, 2020

Graduate and Postdoctoral Studies

Desautels Faculty of Management and the Faculty of Law

Joint M.B.A.; Non-Thesis – General Management and B.C.L./LL.B. (144 cr.)

2. Courses

a) **New Courses**

Reported as having been approved by SCTP on November 5th, 2020: 8

Faculty of Engineering: 2

Desautels Faculty of Management: 2

Faculty of Medicine and Health Sciences: 4

Reported as having been approved by SCTP on November 19th, 2020: 16

Faculty of Arts: 9

Faculty of Education: 5

Desautels Faculty of Management: 1

Faculty of Medicine and Health Sciences: 1

b) Course Revisions

Reported as having been approved by SCTP on November 5th, 2020: 25

School of Continuing Studies: 18

Faculty of Engineering: 3

Desautels Faculty of Management: 3

Faculty of Science: 1

Reported as having been approved by SCTP on November 19th, 2020: 12

Faculty of Arts: 5

Faculty of Education: 2

Desautels Faculty of Management: 1

Faculty of Science: 4

c) Course Retirements

Reported as having been approved by SCTP on November 19th, 2020, 2020:7

Faculty of Arts: 7



(2019)

<p>1.0 Degree Title Please specify the two degrees for concurrent degree programs</p> <p>B.Eng.</p>	<p>2.0 Administering Faculty or GPS</p> <p>Faculty of Engineering</p>
<p>1.1 Major (Subject/Discipline) (30-char. max.)</p> <p>Global Engineering</p>	<p>Offering Faculty & Department</p> <p>Faculty of Engineering / Dean's Office</p>
<p>1.2 Concentration (Option) (30 char. max.)</p> <p></p>	<p>3.0 Effective Term of Implementation (Ex. Sept. 2019 or 201909) Term</p> <p>202109</p>
<p>1.3 Complete Program Title (info from boxes 1.0+1.1+1.2+5.2)</p> <p>B.Eng.; Global Engineering</p>	

4.0 Rationale and Admission Requirements for New Program/Concentration

See attached document

5.0 Program Information
Indicate an "x" as appropriate

<p>5.1 Program Type</p> <p><input checked="" type="checkbox"/> Bachelor's Program</p> <p>Master's</p> <p>M.Sc.(Applied) Program</p> <p>Dual Degree/Concurrent Program</p> <p>Certificate</p> <p>Diploma</p> <p>Graduate Certificate</p> <p>Graduate Diploma</p> <p>Professional Development Cert</p> <p>Ph.D. Program</p> <p>Doctorate Program (Other than Ph.D.)</p> <p>Self-Funded/Private Program</p> <p>Off-Campus Program</p> <p>Distance Education Program</p> <p>Other (Please specify)</p>	<p>5.2 Category</p> <p>Faculty Program (FP)</p> <p><input checked="" type="checkbox"/> Major</p> <p>Joint Major</p> <p>Major Concentration (CON)</p> <p>Minor</p> <p>Minor Concentration (CON)</p> <p>Honours (HON)</p> <p>Joint Honours Component (HC)</p> <p>Internship/Co-op</p> <p>Thesis (T)</p> <p>Non-Thesis (N)</p> <p>Other</p> <p>Please specify</p> <p></p>	<p>5.3 Level</p> <p><input checked="" type="checkbox"/> Undergraduate</p> <p>Dentistry/Law/Medicine</p> <p>Continuing Studies (Non-Credit)</p> <p>Collegial</p> <p>Masters & Grad Dips & Certs</p> <p>Doctorate</p> <p>Post-Graduate Medicine/Dentistry</p> <p>Graduate Qualifying</p> <p>5.4 Requires Centrally-Funded Resources</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>
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<p>6.0 Total Credits or CEUs (if latter, indicate "CEUs" in box)</p> <p>120-128</p>	<p>7.0 Consultation with Related Units</p> <p><input checked="" type="checkbox"/> Yes No</p> <p>Financial Consult <input checked="" type="checkbox"/> Yes No</p> <p>Attach list of consultations.</p>
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8.0 Program Description (Maximum 150 words)

The B.Eng. in Global Engineering is designed to provide students with a combination of hard, technical skills in science and engineering, combined with soft, non-technical skills in the humanities, business/management, and languages. The program focuses on: 1) a strong foundation in mathematics, and all three principal scientific disciplines (physics, chemistry and biology), and 2) specialized engineering training in one of nine streams (Breadth, Biological, Chemical, Civil, Data Science, Electrical, Entrepreneurship, Materials and Mechanical). Moreover, the program is offered, by design, in an international setting (two years at CentraleSupélec in France, and two years at McGill University in Canada), to provide training in the solution of complex scientific/engineering problems that can be undertaken in interdisciplinary teams, in global settings.

9.0 List of proposed new Program/Concentration

If new concentration (option) of existing program, a program layout (list of all courses) of existing program **must** be attached.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit Weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

B.Eng.; Global Engineering (120 credits)

Program credit weight: 120-128 credits

Required Year 0 and Year 1 Courses

60 credits (120 ECTS credits)

Years 0 and 1 of the program take place at CentraleSupélec, in France, and the required Year 0 and Year 1 courses will be taken there. All remaining courses will be taken at McGill.

ACE211 Introduction to Automation and Control (3 ECTS)
ACE212 Robotics Bootcamp (2 ECTS)
BIO111 Cell Biology (3 ECTS)
BIO121 Genetics (2.5 ECTS)
BIO211 Biology of Organisms (2.5 ECTS)
BIO221 Ecosystems and Biodiversity (3 ECTS)
CHEM111 General Chemistry (1.5 ECTS)
CHEM112 Chemistry of Solutions (1.5 ECTS)
CHEM121 Oxidation, Reduction and Electrochemistry (1.5 ECTS)
CHEM211 Thermochemistry 4 (1.5 ECTS)
CSE111 Introduction to Programming (3 ECTS)
CSE112 Coding Week (3 ECTS)
CSE121 Algorithms (1.5 ECTS)
CSE122 Fundamentals of Programming (1.5 ECTS)
CSE221 Advanced Programming (1.5 ECTS)
CSE222 Machine Learning (1.5 ECTS)
ECO221 Organizational Behaviour Week (1 ECTS)
ECO222 Economics of Corporations (2 ECTS)
ECO223 Business Games Week (1 ECTS)
EE221 Elective (3 ECTS)
HSS111 Philosophy, Ethics and Critical Thinking 1 (1 ECTS)
HSS112 Philosophy, Ethics and Critical Thinking 2 (1 ECTS)
HSS121 Topics in International Sustainable Development 1 (1 ECTS)
HSS122 Topics in International Sustainable Development 2 (1 ECTS)
HSS211 Perspectives of Modern Geopolitics 1 (1 ECTS)
HSS212 Perspectives of Modern Geopolitics 2 (1 ECTS)
HSS221 Structure of Corporations 1 (1 ECTS)
HSS222 Structure of Corporations 2 (1 ECTS)
INTERN121 Internship - Social Impact (1 ECTS)
INTERN222 Internship - Company Discovery (1 ECTS)

9.0 List of proposed new Program/Concentration (cont.)

MAA111 Analysis 1 (3.5 ECTS)
MAA112 Analysis 2 (3.5 ECTS)
MAA121 Analysis 3 (3.5 ECTS)
MAA122 Probability (3.5 ECTS)
MAA211 Linear Algebra (4 ECTS)
MAA212 Topology and Functional Analysis (4 ECTS)
MAA221 Numerical Analysis (3 ECTS)
MAA222 Continuous Probability and Introduction to Statistical Modelling (3 ECTS)
ML111 Modern Languages 1 (1 ECTS)
ML112 Modern Languages 2 (1 ECTS)
ML121 Modern Languages 3 (1 ECTS)
ML122 Modern Languages 4 (1 ECTS)
ML211 Modern Languages 5 (1 ECTS)
ML212 Modern Languages 6 (1 ECTS)
ML221 Modern Languages 7 (1 ECTS)
ML222 Modern Languages 8 (1 ECTS)
MOD111 Introduction to Modelling (3 ECTS)
MOD211 Data and Modelling Week (3 ECTS)
PHY111 Mechanics (3 ECTS)
PHY112 Electric Circuits (3 ECTS)
PHY121 Thermodynamics (2.5 ECTS)
PHY122 Physics of Waves (2.5 ECTS)
PHY211 Electromagnetism and Conduction (3 ECTS)
PHY212 Electromagnetism and Waves (3 ECTS)
PHY221 Waves and Optics (3 ECTS)
PM121 Project Management 1 (1 ECTS)
PM122 Project Management 2 (1 ECTS)
PRO121 Project - Sustainable Development (1 ECTS)
PRO221 Project- Research (4 ECTS)

Year 2 and Year 3 Courses

60-68 credits

Years 2 and 3 of the program take place at McGill University, in Canada, and the Year 2 and Year 3 courses will be taken there.

Required Non-Departmental Courses

9 credits

CCOM 206 Communication in Engineering (3)
INTG 201 Integrated Management Essentials 1 (3)
INTG 202 Integrated Management Essentials 2 (3)

Required Faculty of Engineering Courses

4 credits

FACC 200 Industrial Practicum 1 (0)
FACC 250 Responsibilities of the Professional Engineer (0)
FACC 300 Engineering Economy (3)
FACC 400 Engineering Professional Practice (1)

9.0 List of proposed new Program/Concentration (cont.)

Complementary Courses (47-55 credits)

Global Engineering Technical Complementary Courses

38-46 credits

Upon their arrival at McGill in the third year, each student will take 38-46 credits in one of nine streams: 1) Breadth, 2) Biological, 3) Chemical, 4) Civil, 5) Data Science, 6) Electrical, 7) Entrepreneurship, 8) Materials, and 9) Mechanical. The choice of stream will have been determined in advance, at the end of their second year of studies at CentraleSupélec. All streams have (stream-specific) core courses. Some streams have stream-specific technical complementaries and/or sustainability complementaries.

Stream 1: Breadth (41-44 credits)

41-44 credits (13 courses) must be taken, chosen as follows:

26 credits (8 courses) from List A
9-11 credits (3 courses) from List B
6-7 credits (2 courses) from List C

List A: Breadth Stream Core

26 credits

BIEN 310 Introduction to Biomolecular Engineering (3)
CHEE 231 Data Analysis and Design of Experiments (3)
CIVE 207 Solid Mechanics (4)
ECSE 206 Introduction to Signals and Systems (3)
FACC 463D1 Engineering Design Project (3)
FACC 463D2 Engineering Design Project (3)
MECH 220 Mechanics 2 (4)
MECH 309 Numerical Methods in Mechanical Engineering (3)

List B: Breadth Stream Technical Complementaries

9-11 credits

CHEE 370 Elements of Biotechnology (3)
ECSE 308 Introduction to Communication Systems and Networks (4)
ECSE 353 Electromagnetic Fields and Waves (3)
MIME 260 Materials Science and Engineering (3)*
MIME 261 Structure of Materials (3)*
MIME 356 Heat, Mass and Fluid Flow (4)
*Students select either MIME 260 or MIME 261

List C: Breadth Stream Sustainability Complementaries

6-7 credits

SEAD 500 Foundations of Sustainability for Engineering and Design (3)
SEAD 510 Energy Analysis (4)
SEAD 515 Climate Change Adaptation and Engineering Infrastructure (3)
SEAD 550 Decision-Making for Sustainability in Engineering and Design (3)

Stream 2: Biological (38-39 credits)

38-39 credits (13 courses) must be taken, chosen as follows:

32 credits (11 courses) from List A
6-7 credits (2 courses) from List B

List A: Biological Stream Core

32 credits

BIEN 200 Introduction to Bioengineering (2)
BIEN 210 Electrical and Optical Properties of Biological Systems (3)
BIEN 290 Bioengineering Measurement Laboratory (3)
BIEN 310 Introduction to Biomolecular Engineering (3)
BIEN 314 Transport Phenomena in Biological Systems 1 (3)
BIEN 330 Tissue Engineering and Regenerative Medicine (3)
BIEN 340 Transport Phenomena in Biological Systems 2 (3)
BIEN 360 Physical Chemistry in Bioengineering (3)
BIEN 410 Computational Methods in Biomolecular Engineering (3)
BIEN 470D1 Bioengineering Design Project (3)
BIEN 470D2 Bioengineering Design Project (3)

9.0 List of proposed new Program/Concentration (cont.)

List B: Biological Stream Technical Complementaries

6-7 credits

BIEN 320 Molecular, Cellular, and Tissue Biomechanics (3)
BIEN 350 Biosystems and Control (4)
BIEN 390 Bioengineering Laboratory (3)
BIEN 420 Biodevices Design for Diagnostics and Screening (3)
BIEN 462 Engineering Principles in Physiological Systems (3)
BIEN 510 Engineered Nanomaterials for Biomedical Applications (3)
BIEN 530 Imaging and Bioanalytical Instrumentation (3)
BIEN 540 Information Storage and Processing in Biological Systems (3)
BIEN 550 Biomolecular Devices (3)
BIEN 560 Design of Biosensors (3)
BIEN 570 Active Mechanics in Biology (3)
BIEN 590 Cell Culture Engineering (3)
BREE 327 Bio-Environmental Engineering (3)
BREE 420 Engineering for Sustainability (3)
BREE 423 Biological Material Properties (3)
BREE 518 Ecological Engineering (3)
BREE 522 Bio-Based polymers (3)
CHEE 370 Elements of Biotechnology (3)
CHEE 563 Biofluids and Cardiovascular Mechanics (3)*
MECH 547 Mechanics of Biological Materials (3)
MECH 563 Biofluids and Cardiovascular Mechanics (3)*
PHYS 534 Nanoscience and Nanotechnology (3)
*Students select either CHEE 563 or MECH 563

Stream 3: Chemical (41 credits)

CHEE 200 Chemical Engineering Principles 1 (3)
CHEE 204 Chemical Engineering Principles 2 (3)
CHEE 291 Instrumentation and Measurement 1 (4)
CHEE 314 Fluid Mechanics (3)
CHEE 315 Heat and Mass Transfer (3)
CHEE 351 Separation Processes (3)
CHEE 380 Materials Science (3)
CHEE 390 Computational Methods in Chemical Engineering (3)
CHEE 423 Chemical Reaction Engineering (3)
CHEE 453 Process Design (4)
CHEM 234 Topics in Organic Chemistry (3)
FACC 463D1 Engineering Design Project (3)
FACC 463D2 Engineering Design Project (3)

Stream 4: Civil (45-46 credits)

45-46 credits (13 courses) must be taken, chosen as follows:

39 credits (11 courses) from List A

6-7 credits (2 courses) from List B

List A: Civil Stream Core

39 credits

CIVE 202 Construction Materials (4)
CIVE 207 Solid Mechanics (4)
CIVE 225 Environmental Engineering (4)
CIVE 311 Geotechnical Mechanics (4)
CIVE 317 Structural Engineering 1 (3)
CIVE 319 Transportation Engineering (3)
CIVE 320 Numerical Methods (4)
CIVE 327 Fluid Mechanics and Hydraulics (4)
FACC 463D1 Engineering Design Project (3)
FACC 463D2 Engineering Design Project (3)
MECH 289 Design Graphics (3)

9.0 List of proposed new Program/Concentration (cont.)

List B: Civil Stream Technical Complementaries

6-7 credits

CIVE 206 Dynamics (3)
CIVE 225 Environmental Engineering (4)
CIVE 302 Probabilistic Systems (3)
CIVE 318 Structural Engineering 2 (3)
CIVE 319 Transportation Engineering (3)
CIVE 416 Geotechnical Engineering (3)

Stream 5: Data Science (39-40 credits)

COMP 251 Algorithms and Data Structures (3)
COMP 302 Programming Languages and Paradigms (3)
COMP 360 Algorithm Design (3)
COMP 421 Database Systems (3)
COMP 551 Applied Machine Learning (4)*
ECSE 223 Model-Based Programming (3)
ECSE 321 Introduction to Software Engineering (3)
ECSE 343 Numerical Methods in Engineering (3)
ECSE 458D1 Capstone Design Project (3)
ECSE 458D2 Capstone Design Project (3)
ECSE 507 Optimization and Optimal Control (3)**
ECSE 509 Probability and Random Signals 2 (3)
ECSE 526 Artificial Intelligence (3)*
ECSE 551 Machine Learning for Engineers (4)*
MATH 240 Discrete Structures (3)
MECH 559 Engineering Systems Optimization (3)**
MECH 579 Multidisciplinary Design Optimization (3)**
*Students select one of COMP 551, ECSE 526 or ECSE 551
**Students select one of ECSE 507, MECH 559 or MECH 579

Stream 6: Electrical (43 credits)

43 credits (13 courses) must be taken, chosen as follows:

37 credits (11 courses) from List A
6 credits (2 courses) from List B

List A: Electrical Stream Core

37 credits

ECSE 206 Introduction to Signals and Systems (3)
ECSE 210 Electric Circuits 2 (3)
ECSE 222 Digital Logic (3)
ECSE 307 Linear Systems and Control (4)
ECSE 308 Introduction to Communication Systems and Networks (4)
ECSE 324 Computer Organization (4)
ECSE 331 Electronics (4)
ECSE 343 Numerical Methods in Engineering (3)
ECSE 353 Electromagnetic Fields and Waves (3)
ECSE 458D1 Capstone Design Project (3)
ECSE 458D2 Capstone Design Project (3)

List B: Electrical Stream Technical Complementaries

6 credits

COMP 417 Introduction Robotics and Intelligent Systems (3)
ECSE 211 Design Principles and Methods (3)
MECH 412 System Dynamics and Control (3)
MECH 572 Mechanics and Control of Robotic Manipulators (3)
MECH 573 Mechanics of Robotic Systems (3)
MIME 262 Properties of Materials in Electrical Engineering (3)

9.0 List of proposed new Program/Concentration (cont.)

Stream 7: Entrepreneurship (43 credits)

43 credits (13 courses) must be taken, chosen as follows:

40 credits (12 courses) from List A

3 credits (1 courses) from List B

List A: Entrepreneurship Stream Core

40 credits

BIEN 310 Introduction to Biomolecular Engineering (3)
CHEE 231 Data Analysis and Design of Experiments (3)
CIVE 207 Solid Mechanics (4)
ECSE 206 Introduction to Signals and Systems (3)
ECSE 308 Introduction to Communication Systems and Networks (4)
FACC 500 Technology Business Plan Design (3)
FACC 501 Technology Business Plan Project (3)
MECH 220 Mechanics 2 (4)
MECH 309 Numerical Methods in Mechanical Engineering (3)
MGPO 362 Fundamentals of Entrepreneurship (3)
MIME 260 Materials Science and Engineering (3)*
MIME 261 Structure of Materials (3)*
MIME 356 Heat, Mass and Fluid Flow (4)
*Students select either MIME 260 or MIME 261

List B: Entrepreneurship Stream Technical Complementaries

3 credits

BUSA 465 Technological Entrepreneurship (3)
LAWG 570 Innovation for Non-Law Students (3)
MGPO 364 Entrepreneurship in Practice (3)
MGPO 438 Social Entrepreneurship and Innovation (3)
ORGB 321 Leadership (3)

Stream 8: Materials (43 credits)

43 credits (14 courses) must be taken, chosen as follows:

37 credits (12 courses) from List A

6 credits (2 courses) from List B

List A: Materials Stream Core

37 credits

FACC 463D1 Engineering Design Project (3)
FACC 463D2 Engineering Design Project (3)
MECH 290 Design Graphics for Mechanical Engineering (3)
MIME 261 Structure of Materials (3)
MIME 317 Analytical and Characterization Techniques (3)
MIME 345 Applications of Polymers (3)
MIME 350 Extractive Metallurgical Engineering (3)
MIME 352 Hydrochemical Processing (3)
MIME 356 Heat, Mass and Fluid Flow (4)
MIME 360 Phase Transformations: Solids (3)
MIME 362 Mechanical Properties (3)
MIME 473 Introduction to Computational Materials Design (3)

List B: Materials Stream Technical Complementaries

6 credits

MIME 311 Modelling and Automatic Control (3)
MIME 455 Advanced Process Engineering (3)
MIME 465 Metallic and Ceramic Powders Processing (3)
MIME 467 Electronic Properties of Materials (3)
MIME 470 Engineering Biomaterials (3)

9.0 List of proposed new Program/Concentration (cont.)

Stream 9: Mechanical (41-43 credits)

41-43 credits (13 courses) must be taken, chosen as follows:

35 credits (11 courses) from List A

6-8 credits (2 courses) from List B

List A: Mechanical Stream Core

35 credits

CIVE 207 Solid Mechanics (4)
ECSE 206 Introduction to Signals and Systems (3)
MECH 220 Mechanics 2 (4)
MECH 262 Statistics and Measurement Laboratory (3)
MECH 290 Design Graphics for Mechanical Engineering (3)
MECH 292 Design 1: Conceptual Design (3)
MECH 309 Numerical Methods in Mechanical Engineering (3)
MECH 331 Fluid Mechanics 1 (3)
MECH 463D1 Design 3: Mechanical Engineering Project (3)
MECH 463D2 Design 3: Mechanical Engineering Project (3)
MIME 260 Materials Science and Engineering (3)

List B: Mechanical Stream Technical Complementaries

6-8 credits

COMP 417 Introduction Robotics and Intelligent Systems (3)
ECSE 307 Linear Systems and Control (4)
ECSE 461 Electric Machinery (3)
MECH 314 Dynamics of Mechanisms (3)
MECH 315 Mechanics 3 (4)
MECH 321 Mechanics of Deformable Solids (3)
MECH 341 Thermodynamics 2 (3)
MECH 346 Heat Transfer (3)
MECH 360 Principles of Manufacturing (3)
MECH 383 Applied Electronics and Instrumentation (3)
MECH 393 Design 2: Machine Element Design (3)
MECH 412 System Dynamics and Control (3)
MECH 572 Mechanics and Control of Robotic Manipulators (3)
MECH 573 Mechanics of Robotic Systems (3)

9.0 List of proposed new Program/Concentration (cont.)

Complementary Studies

9 credits

Group A – Impact of Technology on Society

3 credits from the following:

ANTH 212 Anthropology of Development (3)
BTEC 502 Biotechnology Ethics and Society (3)
CIVE 469 Infrastructure and Society (3)
ECON 225 Economics of the Environment (3)
ECON 347 Economics of Climate Change (3)
ENVR 201 Society, Environment and Sustainability (3)
GEOG 200 Geographical Perspectives: World Environmental Problems (3)
GEOG 203 Environmental Systems (3)
GEOG 205 Global Change: Past, Present and Future (3)
GEOG 302 Environmental Management 1 (3)
MGPO 440 Strategies for Sustainability (3)*
PHIL 343 Biomedical Ethics (3)
RELG 270 Religious Ethics and the Environment (3)
SOCL 235 Technology and Society (3)
SOCL 312 Sociology of Work and Industry (3)
URBP 201 Planning the 21st Century City (3)

* Note: Management courses have limited enrolment and registration dates. See Important Dates at <http://www.mcgill.ca/importantdates>.

Group B – Humanities and Social Sciences, Management Studies and Law

6 credits at the 200 level or higher from the following departments:

Anthropology (ANTH)
Economics (any 200- or 300-level course excluding ECON 227 and ECON 337)
History (HIST)
Philosophy (excluding PHIL 210 and PHIL 310)
Political Science (POLI)
Psychology (excluding PSYC 204 and PSYC 305, but including PSYC 100)
Religious Studies (RELG) Religious Studies (RELG) (excluding courses that principally impart language skills, such as Sanskrit, Tibetan, Tamil, New Testament Greek, and Biblical Hebrew)**
School of Social Work (SWRK)
Sociology (excluding SOCL 350)

OR from the following courses:

ARCH 528 History of Housing (3)
BUSA 465 Technological Entrepreneurship (3) *
CLAS 203 Greek Mythology (3)
ENVR 203 Knowledge, Ethics and Environment (3)
ENVR 400 Environmental Thought (3)
FACC 220 Law for Architects and Engineers (3)
FACC 500 Technology Business Plan Design (3)
FACC 501 Technology Business Plan Project (3)
HISP 225 Hispanic Civilization 1 (3)
HISP 226 Hispanic Civilization 2 (3)
INDR 294 Introduction to Labour-Management Relations (3)*
MATH 338 History and Philosophy of Mathematics (3)
MGCR 222 Introduction to Organizational Behaviour (3)*
MGCR 352 Principles of Marketing (3)*
ORGB 321 Leadership (3)*
ORGB 423 Human Resources Management (3)*

* Note: Management courses have limited enrolment and registration dates. See Important Dates at <http://www.mcgill.ca/importantdates>.

**If you are uncertain whether or not a course principally imparts language skills, please see an adviser in the McGill Engineering Student Centre (Frank Dawson Adams Building, Room 22) or email an [adviser](#).

Note regarding language courses: Language courses are not accepted to satisfy the Complementary Studies Group B requirement.

10.0 Approvals			
Routing Sequence	Name	Signature	Meeting Date
Department			
Curric/Acad Committee	Roni Khazaka	<i>Roni Khazaka</i>	Feb 26, 2020
Faculty 1	Roni Khazaka	<i>Roni Khazaka</i>	Mar 10, 2020
Faculty 2			
Faculty 3			
CGPS			
SCTP	SCTP APPROVED		Nov. 5, 2020
APC			APC approved
Senate			
Submitted by			
Name	Laurent Mydlarski	To be completed by ES:	
Phone	7252	CIP Code	
Email	laurent.mydlarski@mcaill.ca		
Submission Date	Feb 26, 2020		

REMINDERS:

*Box 5.4 – Must be completed; see section 6.5.4 within the New Program Guidelines at:

<https://www.mcgill.ca/sctp/guidelines>.

**All new program proposals must be accompanied by a 2-3 page support document.

4.0 Rationale and Admission Requirements for the Proposed New Joint B.Eng. Program in Global Engineering, Offered by CentraleSupélec and McGill

The goal of this collaboration is to create a groundbreaking, global undergraduate engineering program that combines the strengths of top engineering schools from both Europe and North America. In particular, the aim is to create a unique program from which graduates should be capable of functioning in interdisciplinary teams, in an agile way, to address/solve complex scientific/engineering problems in international settings, and who will eventually become the international leaders, innovators, creators and managers of tomorrow.

The proposed program will be truly global, with respect to its:

- joint, co-hosted, European / North American foundation,
- multicultural student body,
- student experience,
- education, and
- academic recognition.

Creation of this program is a joint endeavour between CentraleSupélec and McGill University. CentraleSupélec was formed in 2008 as a strategic alliance between École Centrale des Arts et Manufactures (founded in 1829) and École Supérieure d'Electricité (founded in 1894). CentraleSupélec is also part of the Paris-Saclay university research and business mega-cluster (9,000 professors / researchers and 60,000 students), located southwest of Paris, which currently accounts for 15% of French research output. CentraleSupélec has a long tradition of training “ingénieurs généralistes.” McGill University (founded in 1821) is a top Canadian university in Montréal, Québec, Canada that has been training engineers since 1855. In contrast to CentraleSupélec, the training of engineers at McGill is specialized, with students being admitted in to a given engineering discipline (e.g. Civil, Electrical, Mechanical, etc.) and specializing very early on in their education. This partnership between two different, yet complementary institutions with similar histories and reputations underlies the creation of this new program, which is a hybrid of their two respective engineering education traditions. It aims to bring the “best of both worlds” by achieving a new model between “breadth” (generalization) and “depth” (specialization), all the while ensuring to train engineers who have strong soft skills, including increased social and environmental awareness, a fundamental knowledge of how businesses and organizations function, and the ability to thrive in a multicultural environment.

An overview of the program is depicted in figure 1. Note that the courses in the first two years will take place at CentraleSupélec, and those in the latter two years will take place at McGill. To overcome part of the challenge of designing a truly hybrid program, two summer schools (green boxes) and three internships (blue boxes) will be take place during the three summers between the first and last years to ensure a blended student experience. The summer schools will be led by instructors from both CentraleSupélec and McGill, but are not program requirements. On the other hand, the three internships form part of the (formal) curriculum. Figure 2 depicts a conceptual / graphical overview of the structure of 4 years of the program, with additional details of structure of the CentraleSupélec curriculum in the first two years at given in figure 3.

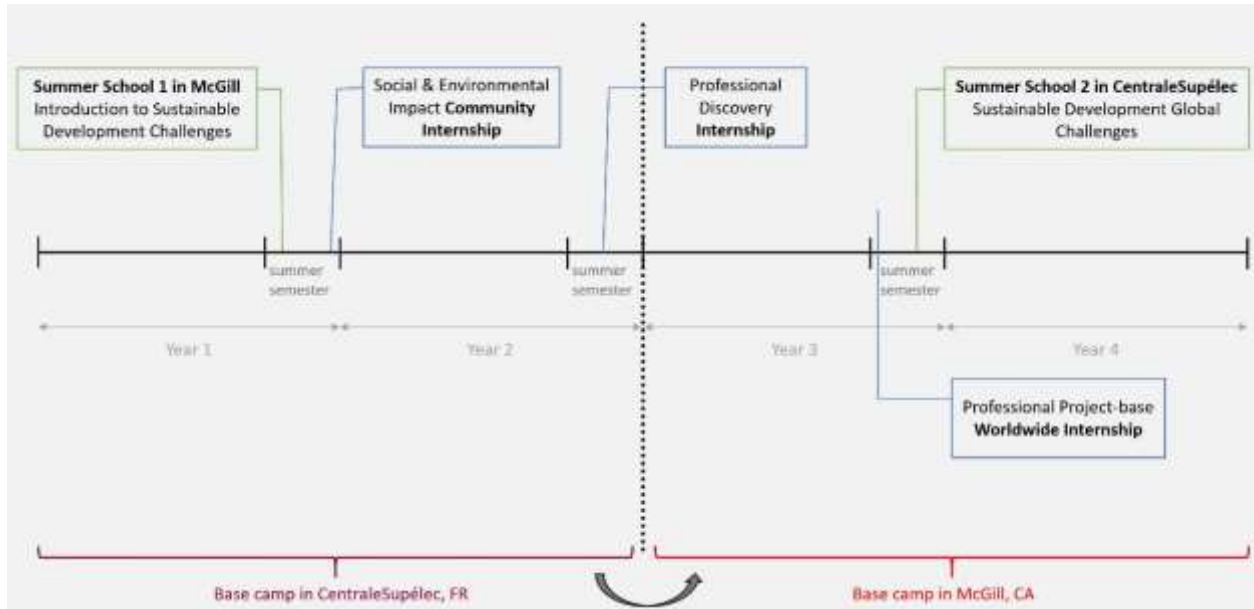


Figure 1: Overview of the proposed joint Program in Global Engineering

An expanded overview of the 4 years of the proposed joint program is provided in Figure 2.

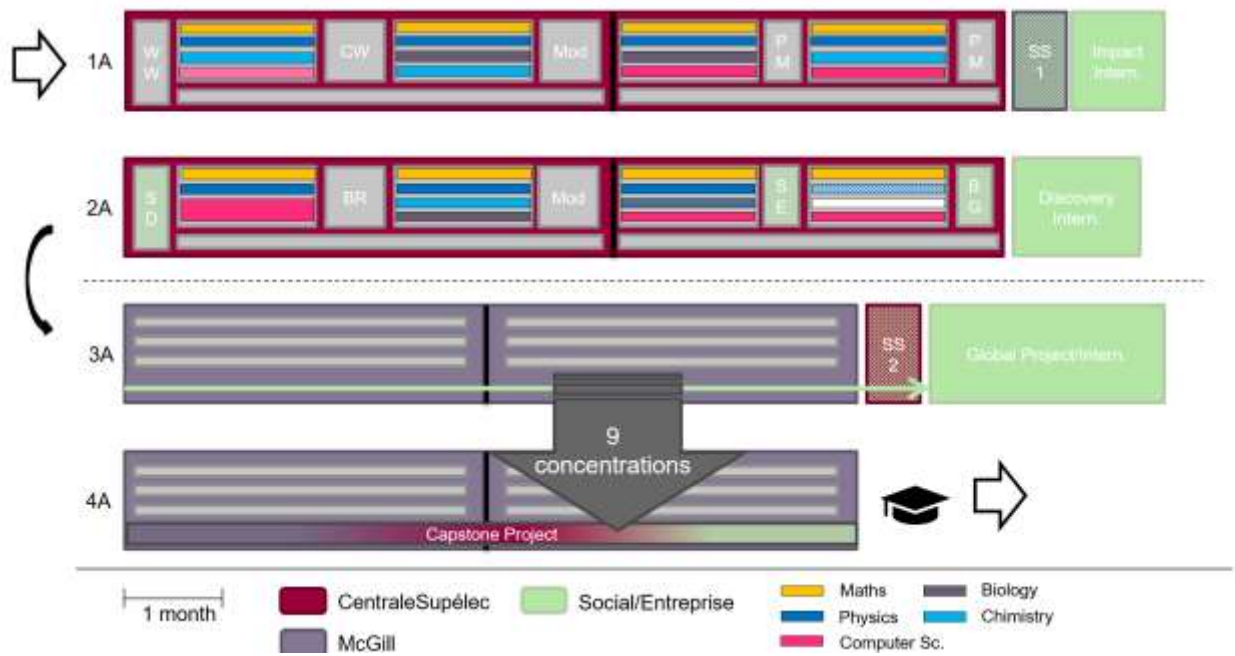


Figure 2: Further details of the joint program in Global Engineering.

First and second years at CentraleSupélec

The first two years of the proposed joint program will provide the students with the necessary foundations of their engineering education in mathematics, physics, chemistry, biology and computer science. Their technical courses will also be complemented with courses in physical education, language, and key global issues for the future engineer. The coursework in the first two years will also be interrupted with various week-long, immersive “boot-camps” dealing with coding, modelling, project management, robotics, data science, and management. Note that all instruction at CentraleSupélec will be offered in English, in new courses developed for this joint program. Moreover, the breadth of the subject matter, both in the sciences (e.g. foundations in *all three sciences* – biology, chemistry and physics) and in non-technical disciplines, is to be noted. Lastly, note that the courses in the first two years of the proposed program have been deemed effectively equivalent to a list of McGill courses (which will be used to ensure the pre-requisites for the courses taken at McGill in the third and fourth years).



Figure 3: Details of the structure of the curriculum for Years 1 and 2

Third and fourth years at McGill

Following the two common first years at CentraleSupélec, students in Years 3 and 4 at McGill will:

- take courses that are both taught and evaluated in the standard McGill / North American ways (to further expose students to different cultures)
- choose the “breadth” stream or one of the more specialized “depth” streams
- further develop their non-technical skills, e.g.
 - o take courses covering the fundamentals of management / business
 - o take increased number of courses in the humanities
 - o participate in further internships and summer schools

It is worth emphasizing that the streams will be more specialized than a typical CentraleSupélec programs but more generalized than a typical McGill program, ensuring the hybrid nature of the proposed program.

Streams:

At McGill, students will enrol in one of 9 streams:

1 breadth stream

⇒ Stream that covers the fundamentals of engineering

8 depth streams

Mix of common/specialized courses in Year 3; Specialized courses in Year 4

⇒ Biological

⇒ Electrical

⇒ Chemical

⇒ Entrepreneurial

⇒ Civil

⇒ Material

⇒ Data Science

⇒ Mechanical

All streams culminate with a year-long, final, capstone team project. Continuing with the hybrid, international spirit of the proposed curriculum, students will be assessed according the local norm, i.e.

- At CentraleSupélec, assessed according to the French system (i.e. graded on 20)
- At McGill, assessed according to the McGill/North American system (i.e. GPA out of 4.0)

Final overall assessment and ranking will be based on a hybrid scheme, using aggregated data from CentraleSupélec and McGill to ensure equivalency and fairness. Students graduating from the program will receive a joint CentraleSupélec - McGill diploma. We envision that convocation will alternate between France and McGill on a yearly basis.

Student life

Students will be jointly and closely followed by staff from both institutions with respect to academic progress and other aspects of their student life. We expect that cohorts of students will develop a sense of unity, as they will spend their first two years of study together. This sense of unity will continue to be fostered in their final two years at McGill (even though they will no longer be all taking the same courses) by way of cultural activities, and by establishing a base/centre for them within the Engineering complex at McGill (presumably located near the offices of the Program Director and her/his affiliated support staff, who will be responsible for the program at McGill).

Recruitment

We anticipate the recruitment and admissions for this program will be principally handled by McGill's Enrolment Services, given the larger, extensive, established infrastructure that already exists at McGill for these purposes.

Admissions Requirements:

Admissions requirements will be the same as those for admission to McGill undergraduate Engineering programs (in U0). Students from Québec will be admitted to this program following the (successful) completion of one year of CEGEP studies. The demographics of the students admitted to this program will be as follows:

- 34% students from Canada (23% from Québec; 11% from the rest of Canada)
- 33% students from France
- 33% international students

Scholarships and Bursaries:

Scholarships and bursaries will be made available to students by way of the established McGill internal funding mechanisms (i.e. via a fraction of the program revenues being directed to the appropriate funds at Enrolment Services). However, additional student awards will be solicited from donors with the assistance of the McGill Faculty of Engineering Advancement Office and the Fondation CentraleSupélec. (Preliminary discussions with potential donors in both Montréal and Paris have been especially encouraging.)

Student interest

As testified at McGill Faculty of Engineering Academic and Faculty Committee meetings, the response of students has been enthusiastic. Nevertheless, such evidence is only anecdotal, and focus groups are being undertaken to provide further evidence to this effect to include in the Program Dossier to be submitted to the BCI and MEES. Student (and parental) interest in France / at CentraleSupélec is equally high. Representatives from CentraleSupélec have also been in direct contact with the *Agence pour l'enseignement français à l'étranger* (AEFE), which is the “national public agency under the administration of the Ministry of Foreign Affairs of France that assures the quality of schools teaching the French national curriculum outside France.” AEFE administrators have been especially positive with respect to the proposed program, and would be certain to recommend it to graduates of their (495) member schools from across the world that are interested in studying engineering.

Similar programs at other institutions:

The proposed program is quite unique, with no similar joint, international, undergraduate engineering programs being offered, to the best of our knowledge. “2+2” and “dual degree” programs do exist at other institutions. However, the joint nature of this program (i.e. 1 diploma, with 2 university names on it) is unique in the context of international engineering education at the undergraduate level.

Language of instruction:

The language of instruction, at both CentraleSupélec and McGill, will be English.

McGILL UNIVERSITY

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MEMORANDUM

Tel.: (514) 398-7251
 FAX: (514) 398-7379
 Email: jim.nicell@mcgill.ca

FROM: Professor Jim A. Nicell
 Dean of Engineering

DATE: May 27, 2020

TO: Professor Christopher Manfredi
 Provost & Vice Principal (Academic)
 Chair of Academic Policy Committee (APC)

RE: Proposed name change of the Department of Civil Engineering and Applied Mechanics

As Dean of the Faculty of Engineering, I am submitting a request to the Academic Policy Committee (APC) to approve a change in name of our Department of Civil Engineering and Applied Mechanics to the "Department of Civil Engineering."

Background and Rationale/Issues to be Addressed

While the discipline of applied mechanics has historically been a strength of the Department, the range of expertise of professors in the Department has evolved and grown considerably over the past decades to include other sub-disciplines, including structural, environmental, geotechnical, transportation, and water resources engineering. Indeed, much of what is taught and researched in the field of civil engineering relies on theories of applied mechanics. However, this topic is not independent of the other sub-disciplines in the field of civil engineering, but rather is one of the fundamental components of this broader field of study. In addition, it should be noted that the applied mechanics area is not confined to the domain of civil engineering, but is also a fundamental component of related fields, including mechanical engineering and materials engineering, among others. Therefore, the Department is of the view that the discipline of applied mechanics should not be presented as separate or distinct from civil engineering in the title of Department. Moreover, the shortened name encompasses the scope of all teaching in the Department as well as the research activities and expertise of all faculty members, without favoring one specific area over another.

The proposed name is consistent with the undergraduate engineering degree offered by the Department, which is "Bachelor of Engineering in Civil Engineering," which includes the sub-disciplines listed above. Two accreditation visits ago, specifically in 2012, the mismatch between the department name and the degree names was brought to the Department's attention by the Canadian Engineering Accreditation Board (CEAB) visiting team. While the naming of departments is not a matter that falls within the jurisdiction of the CEAB, the comments raised during the visit reflects the confusion that sometimes arises from the current name of the Department. In response to this, discussions were initiated within the Department and, at that time, the majority of professors voted in favor of the name change proposed above. However, before finalizing the name change, additional discussions ensued where the inclusion of other specific disciplines within the department name was explored. This resulted in considerable delays in bringing the name change forward for formal approval. However, despite extensive discussions, no other satisfying name change was forthcoming from these discussions and the Department has concluded that it is now ready to proceed with the name change.

The proposed name change is consistent with the names of many leading departments in Canada, including:

- University of British Columbia - Department of Civil Engineering
- Queens University - Department of Civil Engineering
- McMaster University - Department of Civil Engineering
- University of Ottawa - Department of Civil Engineering
- University of Calgary - Department of Civil Engineering
- University of Manitoba - Department of Civil Engineering
- Memorial University of Newfoundland - Department of Civil Engineering
- Ryerson University - Department of Civil Engineering

- York University - Department of Civil Engineering

It is worth noting that there are numerous instances of civil engineering departments in North America that include fields such as environmental engineering or building engineering in their names. However, these department names typically reflect the fact that these units offer formal programs in these other areas, which is not currently the case for McGill's department.

Considering the above, it is now time for McGill's Department to adopt a name that properly reflects its overall mission.

Consultation

Consultations within the Faculty of Engineering raised no concerns, especially because the name is being shortened, with no new words being added nor any expansion of the unit's scope being stated nor implied. Moreover, following a Notice of Motion presented at the February 11, 2020 meeting of the Faculty Council of the Faculty of Engineering, the motion to change the name of the department to the "Department of Civil Engineering" was unanimously approved at the March 10, 2020 meeting of the Faculty Council. I and the leadership team of the Faculty of Engineering are also in full support of the proposed name change.

Impact of Decision, next steps

There is a clear sense among Engineering faculty members that this name change will better reflect the current teaching and research activities in the Department. It will also help resolve any confusion or concerns that may arise from the current name, which implies a particular strength or focus of the department on the area of applied mechanics.

Following approval by APC, then Senate and the Board of Governors, the Department Chair will immediately adjust all internal and external communication media (including website and Faculty letterhead, etc.) to reflect the new department name. We will ensure communication of a succinct but impactful supporting statement as to the purpose and intent of this change.

Conclusion

On behalf of the Faculty of Engineering, it is my hope that APC, Senate and the Board of Governors will respond favorably to this request. Of course, I and the Chair of the Department, Professor Mohamed Meguid, would be pleased to answer any questions about the proposed name change.



Jim A. Nicell

JAN/ab

cc: Mme. Julie Degans, Academic Program Officer
Mme. Yasmine Jouhari, Academic Program Officer
Prof. Laurent, Mydlarski, Associate Dean (Academic Programs)
Prof. Mohamed Meguid, Chair, Department of Civil Engineering & Applied Mechanics