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Appendix A - List of Graduate Courses for Calendar

Core Mechanical Engineering Graduate Courses (for credit):

Program: Mechanical Engineering
Course Number: ME6101
Credit Value: 3.0
Long Course Title: Microfluidics and Nanofluidics
Short Course Title: Microfluidics and Nanofluidics
Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Low Reynolds number fluid dynamics; liquid and gas flows; surface tension, wetting and capillarity; thermal effects; lubrication theory; experimental methods; biofunctionalization; fabrication techniques; fluids in nanochannels

Pre-requisites: Consent of the Instructor

Program: Mechanical Engineering
Course Number: ME6102
Credit Value: 3.0
Long Course Title: Interfacial Phenomena
Short Course Title: Interfacial Phenomena
Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: Interfacial thermodynamic principles; equilibrium conditions; contact angles; capillarity and wetting; surface forces and tension; drop-surface interactions; introduction to fluid mechanics involving interfaces; interfacial measurement techniques; special topics on applications

Pre-requisites: MECH 2201, 3202, or consent of the Instructor
Program: Mechanical Engineering

Course Number: ME6103

Credit Value: 3.0

Long Course Title: Convective Heat Transfer

Short Course Title: Convective Heat Transfer

Effective Session: Fall 2016

Calendar (Short) Course Description (<60 words):
Topics include: Governing conservation equations; examples of formulation and solution; laminar boundary layer; integral method; turbulent heat transfer

Pre-requisites: MECH2201, MEC2202, MECH3202; and MECH3203 (or equivalent)

Program: Mechanical Engineering

Course Number: ME6201

Credit Value: 3.0

Long Course Title: Advanced Continuum Mechanics

Short Course Title: Advanced Continuum Mechanics

Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: Indicial notation and tensor calculus; kinematics of a continuum: material and spatial descriptions, infinitesimal strain and rotation tensors, Lagrangian and Eularian strain tensors, etc.; conservation laws; isotropic and anisotropic linearly elastic solids under small normal, torsional and bending deformations; Newtonian viscous fluids: properties interpretation, Navier-Stokes equation, analysis of special cases, etc.

Pre-requisites: MECH2301, 2302, 2503, 3202, 3501, 3502
Program: Mechanical Engineering
Course Number: ME6202
Credit Value: 3.0
Long Course Title: Advanced Dynamics
Short Course Title: Advanced Dynamics
Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: Dynamic system; rigid body kinematics; rigid body kinetics; D’Alembert principle; Lagrange’s Equation; variational principle, Hamilton’s principle; Hamilton-Jacobi theory; stability of dynamic systems; applications to a variety of engineering problems.
Pre-requisites: MECH 2302, 3501 and MATH 2270 (or equivalent)

Course Number: ME6301
Credit Value: 3.0
Long Course Title: The Finite Element Method in Engineering Analysis
Short Course Title: Finite Element Method
Effective Session: Winter 2016

Calendar (Short) Course Description (<60 words):
Topics include: variational formulations and approximation for continuous systems; stiffness matrix formulations of truss and beam elements; isoparametric finite elements and application to 2D & 3D elements; shell elements; static and dynamic analyses; steady state thermal analysis (conduction only); mass matrix formulations; vibration eigen value problems; solvers to static and vibration analyses; verification and validation in finite element procedures.
Pre-requisites: CSE 1011, MECH 2301, MECH 4402
Program: Mechanical Engineering

Course Number: ME6401

Credit Value: 3.0

Long Course Title: Design and Fabrication of Polymer Composites and Nanocomposites

Short Course Title: Composites and Nanocomposites

Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: advantages and problems of heterogeneous materials; structure, processing, and properties of composites and nanocomposites; material selections for filler, matrix, and additives; testing and properties of composites and nanocomposites; processing technologies of composites and nanocomposites; applications of composites and nanocomposites in traditional (e.g., automotive and aerospace) and emerging areas (e.g., biomedical and energy).

Pre-requisites: MECH2301 and 3502 (or equivalent)

Program: Mechanical Engineering

Course Number: ME6402

Credit Value: 3.0

Long Course Title: Smart and Multifunctional Materials

Short Course Title: Smart and Multifunctional Materials

Effective Session: Fall 2016

Calendar (Short) Course Description (<60 words):
Topics include: Shape memory materials; electrically activated materials; magnetically activated materials; optically activated materials; chemically activated materials; structure, processing and properties of smart materials; research, development, and applications of smart materials.

Pre-requisites: Consent of the Instructor
Program: Mechanical Engineering

Course Number: ME6501

Credit Value: 3.0

Long Course Title: Advanced Engineering Mathematics

Short Course Title: Advanced Engineering Mathematics

Effective Session: Winter 2016

Calendar (Short) Course Description (<60 words):
Topics include: matrices; review of ordinary differential equations; solutions to systems of simultaneous linear differential equations, Laplace transform, and eigenvalue methods; formulation of partial differential equations for engineering problems; solution to partial differential equations using the separation of variables, Sturm–Liouville theory, finite and infinite Fourier and Hankel transforms; variational calculus. Examples include Laplace, heat, Navier–Stokes equations, etc.

Pre-requisites: MATH 2270 (or equivalent)
**Compulsory Graduate Courses (not for credit):**

<table>
<thead>
<tr>
<th>Program:</th>
<th>Lassonde School of Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Number:</td>
<td>ENG 6000</td>
</tr>
<tr>
<td>Credit Value:</td>
<td>0.0</td>
</tr>
<tr>
<td>Long Course Title:</td>
<td>Engineering Ethics</td>
</tr>
<tr>
<td>Short Course Title:</td>
<td>Engineering Ethics</td>
</tr>
<tr>
<td>Effective Session:</td>
<td>Fall 2015</td>
</tr>
</tbody>
</table>

**Calendar (Short) Course Description (<60 words):**
*Topics include: Ethical responsibilities for engineering profession; academic and research integrity; technology impact on society; sustainable development and corporate citizenship; public health and safety.*

*Pre-requisites: None*

<table>
<thead>
<tr>
<th>Program:</th>
<th>Mechanical Engineering</th>
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<tbody>
<tr>
<td>Course Number:</td>
<td>MECH 6000</td>
</tr>
<tr>
<td>Credit Value:</td>
<td>0.0</td>
</tr>
<tr>
<td>Long Course Title:</td>
<td>Graduate Seminar</td>
</tr>
<tr>
<td>Short Course Title:</td>
<td>Graduate Seminar</td>
</tr>
<tr>
<td>Effective Session:</td>
<td>Winter 2016</td>
</tr>
</tbody>
</table>

**Calendar (Short) Course Description (<60 words):**
*Topics include: Research presentation event to develop and improve graduate students’ presentation skills and techniques for their future career paths and to widen the scope of their knowledge by exposing them to research topics in other areas of Mechanical Engineering to establish a sense of community.*

*Pre-requisites: None*
Program: Mechanical Engineering

Course Number: MECH 9001

Credit Value: 0.0

Long Course Title: MSc Thesis

Short Course Title: MSc Thesis

Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: students enrolled in performing research towards completion of the thesis requirement for MSc degree.

Pre-requisites: None

Program: Mechanical Engineering

Course Number: MECH 9002

Credit Value: 0.0

Long Course Title: Ph.D. Thesis

Short Course Title: Ph.D. Thesis

Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: students enrolled in performing research towards completion of the thesis requirement for Ph.D. degree.

Pre-requisites: None
Complementary Education and Training Courses (for credit):

Program: Lassonde School of Engineering
Course Number: ENG 6001
Credit Value: 3.0
Long Course Title: Legal Aspects and Governance in Engineering
Short Course Title: Legal Aspects and Governance in Engineering
Effective Session: Fall 2015

Calendar (Short) Course Description (<60 words):
Topics include: intellectual property; insurance, directors’ liability, and business associations law; international/transnational governance; environmental law and basics of contract law.

Pre-requisites: None

Program: Schulich Business School
Course Number: ENTR 6xxx
Credit Value: 3.0
Long Course Title: Entrepreneurship and Technology Ventures
Short Course Title: Entrepreneurship and Technology Ventures
Effective Session: Winter 2016

Calendar (Short) Course Description (<60 words):
Topics include: This course provides the student with an understanding of the challenges and opportunities facing an entrepreneur in the process of creating a technology-based business. By developing a cohesive and effective business plan for such venture, students are expected to turn an idea into an enterprise, engaging potential customers and revisiting the plan to focus on what customers really want.

Pre-requisites: None
Program: Education

Course Number: EDUC 5414

Credit Value: 3.0

Long Course Title: Teaching and Learning in PSE, a study of traditional and emerging pedagogies including lectures, online learning, adult learning and student centred teaching

Short Course Title: Teaching and Learning in post secondary education

Effective Session: Winter 2016

Calendar (Short) Course Description (<60 words):
Topics include: This course examines traditional and emerging approaches to teaching and learning in post-secondary education. It explores the development of teaching methodologies in colleges and universities in Canada and other international venues. In particular students are encouraged to critically evaluate traditional methods and explore one or more selected methodology in the form of a review, group presentation and reflective paper.

Pre-requisites: None

Program: Lassonde School of Engineering

Course Number: ENG 6002

Credit Value: 3.0

Long Course Title: The Arts and Sciences of Scholarly Writing

Short Course Title: The Arts and Sciences of Scholarly Writing

Effective Session: Winter 2016

Calendar (Short) Course Description (<60 words):
Topics include: General aspects and rhetoric of scholarly writing; presentation of research findings; writing for readers with varying levels of technical knowledge; resources for finding out about funding opportunities; characteristics of successful and unsuccessful grant proposals; review and critique proposals of your peers.

Pre-requisites: None
Appendix B - Graduate Seminar Series

The Graduate Seminar Series is a single-day research presentation event that is conducted twice annually (in June and December) at the Department of Mechanical Engineering. Participation in this event is required for all graduate students and counts towards fulfilment of their degree requirements as a non-credit course MECH 6000 at York University. The main purposes of this event is to develop and improve graduate students' presentation skills and techniques for their future career paths and to widen the scope of their knowledge by exposing them to research topics in other areas of Mechanical Engineering to establish a sense of community.

1- **Administration**: This event will be planned by the Graduate Program Director (GPD) and the administration staff of the Department of Mechanical Engineering and conducted by the faculty members of the department who will chair the presentation sessions throughout the day. The Graduate Seminar Series starts at 9AM and ends at 5PM. The presentation sessions are 1hr in length (three presentations per session) and the chairs of the sessions are assigned by the GPD.

2- **Participation**: All M.A.Sc. and Ph.D. students registered full-time at the Department of Mechanical Engineering are required to participate in this event in full. Full participation consists of successfully satisfying all the requirements listed below:
   a) Every year, each M.A.Sc. and Ph.D. student is required to deliver a 15min research-related presentation followed by a 5min question and answer session at the Graduate Seminar Series. Students whose final thesis/dissertation defense is scheduled before September 1st or who joined the program after January 1st of the same year are exempted from presenting but still required to attend the event in full.
   b) Presenters should work with their supervisors to prepare and submit a Student Activity Report (maximum of 10-page) to their designated supervisory committee members at least 5 days before the Graduate Seminar Series event. Previous-year coursework and research progress as well as the future plan, published journal and conference papers, and leadership and entrepreneurship activities should be discussed clearly in this report.
   c) The Graduate Seminar Series provides the students with an opportunity to rehearse their presentation and improve it for a subsequent Supervisory Committee meeting that has to be planned and conducted within one month of completion of the Graduate Seminar Day for all Ph.D. students.
   d) Attendance will be taken at each session by the chairs. A minimum of 80% attendance throughout the day is required to pass. If for any reason a student is not able to attend some sessions or the entire event, one should contact the GPD and the chair of the session well ahead of time and schedule alternate session (either June or December).

3- **Organization and Evaluation**: Before the Graduate Seminar Series day, the chair of each session will be responsible for collection of Student Activity Reports and selection of two faculty members (either the Supervisory Committee members or other professors
from any department at York University) and one Mechanical Engineering graduate student who will act as referees of their sessions. On the Graduate Seminar day, the chairs will run the sessions and provide the referees with evaluation forms (provided by GPD) that have to be filled and submitted to the chair by the end of each session. Other graduate students will also receive an evaluation form to provide feedback to each presenter. The referees and graduate students can nominate their preferred presentations for the best presenter award on the evaluation form. The chairs are responsible for collection of all evaluation forms and submitting them to the Mechanical Engineering Graduate Program office. The evaluation forms will be assessed by an award committee (established by the GPD) to select the best Mechanical Engineering Graduate Seminar Presenter.

Preparing a presentation

Please keep the tips and recommendations below in mind when preparing your presentation and or attending the Graduate Seminar Series:

1- Your audiences are perhaps interested in your work and have an academic background, but they are not necessarily experts in your field of research. So keep your presentation level at a stage that is understandable to this audience. This is of particular importance to Ph.D. students who will have dissertation examiners and judges with minimal or even no knowledge of their topics at all.

2- Keep the timing of your presentation strictly to 15 minutes. Many details can be discussed in the 5min Q and A session that follows each presentation if the audience is interested.

3- Use a maximum slide numbers of 15 and a minimum font size of 18. Review your slides with your supervisor and rehearse with your fellow graduate students. Present in a loud and clear voice and face the audience when delivering your presentation.

4- Your presentation should preferably include the sections below:
   a) Project: Description of the research project, current knowledge and practice and expected contributions
   b) Investigation: Phenomenon under investigation, experimental setups / numerical analysis, accuracy, precision, errors, etc.
   c) Analysis: Procedures and results, their accuracy and conclusions drawn
   d) Conclusion: Dissemination of the research results and the expected impact
Appendix C - Examination Requirements for M.A.Sc. and Ph.D. Programs

The oral examinations for both Master’s candidates and Doctoral candidates are in accordance to the guidelines specified by the Faculty of Graduate Studies at York University. The details are stated in: http://www.yorku.ca/grads/policies_procedures/thesis_dissertations_section4.html.

1. Master’s Thesis & Examination

All candidates, after the formal submission of the thesis, will participate in an oral examination, centred on the thesis-research.

1.1. Master’s Thesis Exam Committees

A thesis examining committee shall consist of at least three voting members, including the Chair, as follows:

a. two graduate faculty members chosen from the Department of Mechanical Engineering at the Lassonde School of Engineering, one of whom will serve as Chair of the examining committee;

b. one graduate faculty member at arm's length from the supervisor, and normally from outside the Department of Mechanical Engineering at the Lassonde School of Engineering.

1.2. Scheduling of Master’s Thesis Oral Exams

Oral examinations for master’s theses shall be held normally no less than three weeks from the date on which copies of the completed thesis approved by the supervisor are sent to each member of the examining committee.

1.3. Master’s Thesis Oral Exam Evaluation

In accordance with the evaluation guidelines specified by the Faculty of Graduate Studies, the committee should reach one of the following four decisions for the Oral Examination:

a. Accepted with No Revision
b. Accepted Pending Specified Revisions: Specified revisions must be completed within six months of the date of the oral exam.

c. Referred Pending Major Revisions: The committee will agree on (a) reconvene within twelve months to continue the oral examination; or (b) circulate the revised thesis within twelve months to all members to decide if the stipulated requirements have been met.
d. Failed

2. Doctoral Dissertation & Examination

All candidates, after the formal submission of the dissertation, will participate in an oral examination, centred on the dissertation-research.

2.1. Doctoral Dissertation Exam Committees

A dissertation examining committee will have the following composition, with at least four voting members:
a. The Dean of the Faculty of Graduate Studies or her/his representative, who will be at arm’s length from the supervision of the dissertation, and who will serve as Chair of the examining committee and will be a non-voting member;
b. One external examiner, from outside York University, at arm’s length from the dissertation, recommended by the graduate program director (voting member);
c. one graduate faculty member at arm’s length from the dissertation, and normally from outside the Department of Mechanical Engineering at the Lassonde School of Engineering, recommended by the graduate program director (voting member);
d. two graduate faculty members from the supervisory committee, or one member from the supervisory committee and one graduate faculty member from the Department of Mechanical Engineering at the Lassonde School of Engineering (voting members).

2.2. Scheduling of Doctoral Dissertation Oral Exams

Oral examinations for doctoral dissertations shall be held normally no less than three weeks from the date on which copies of the completed dissertation approved by the supervisory committee are sent to each member of the examining committee. The oral exam may be held less than three weeks from the time copies are sent to the examining committee provided all parties agree.

2.3. Doctoral Dissertation Oral Exam Evaluation

In accordance with the evaluation guidelines specified by the Faculty of Graduate Studies, the committee should reach one of the following four decisions for the Oral Examination:

a. Accepted with No Revision
b. Accepted Pending Specified Revisions: Specified revisions must be completed within six months of the date of the oral exam.
c. Referred Pending Major Revisions: The committee will agree on (a) reconvene within twelve months to continue the oral examination; or (b) circulate the revised thesis within twelve months to all members to decide if the stipulated requirements have been met.
d. Failed

Under special circumstances, if no agreement is achieved by the voting members of the examination committee on the outcome of the oral examination, then the Chair of the examining committee will arrive to a conclusive decision through a consultation process within a week’s time.

3. Doctoral Comprehensive Examination

All candidates enrolled in the Ph.D. program in Mechanical Engineering need to take the doctoral comprehensive examination. It is encouraged that the student takes this examination as early as possible in consultation with the supervisory committee. The exam should be taken within 12 to 16 months after the student starts the Ph.D. program.

The purpose of this comprehensive examination is two folds: (a) to assess the student’s fundamental knowledge in mechanical engineering and of the subject matter relevant to the thesis; (b) to assess the student’s ability to conduct independent research of highest quality.
The students need to prepare a short report outlining their research work conducted, proposed research plan and timeline for completion of their degree requirements. The students need to present this report in front of the doctoral comprehensive examination committee. This is an open presentation, typically for 15 – 20 mins followed by question and answer period from the audience attending the presentation part of the examination. It will be followed by a closed-door oral examination by the examination committee members. Typically, the first round of questions will assess the student’s fundamental knowledge in the discipline. The second and subsequent round of questions will be towards assessing student’s understanding of the research topic presented during the part of this examination process.

3.1. Doctoral Comprehensive Exam Committees

A comprehensive examining committee shall consist of at least three voting members, including the Chair, as follows:

a. One examiner, from the Lassonde School of Engineering, at arm’s length from the supervisor and who will serve as Chair of the examining committee;

b. two graduate faculty members from the supervisory committee

3.2. Scheduling of Doctoral Comprehensive Exams

Examination shall be held normally no less than three weeks from the date on which copies of the short report are sent to each member of the examining committee. The oral exam may be held less than three weeks from the time copies are sent to the examining committee provided all parties agree.

3.3. Doctoral Comprehensive Exam Evaluation

The committee should decide on the following two criteria:

(i) Whether the student possesses adequate knowledge of the discipline and of the subject matter relevant to the thesis

(ii) Whether the student is able to perform independent research at highest level as expected from a doctoral student.

Based on above two criteria, the committee should reach one of the following three decisions for the Comprehensive Examination

a. Pass

b. Conditional Pass: Provide specific details in terms of deficiencies of the student, clear direction in terms of the conditions and the time frame under which the conditions to be met by the student.

c. Fail: The committee will agree on (a) reconvene within six months to conduct the re-examination; or (b) recommend change of category to a Master’s program; or (c) termination of the doctoral program.
Appendix D – Progress Report

Every student enrolled in the graduate program need to complete the Progress Report, at least 5 days before the scheduled Graduate Seminar Series event in a given academic calendar. This report needs to be submitted to the Graduate Program Director.

PART A - BASIC INFORMATION

1. STUDENT INFORMATION

Student's Name: ____________________       ID #: __________________         Degree: ______________

Number of terms completed in program (do not Include the current term): _________

Research Area or Expected Thesis Title:
_________________________________________________________________

2. SUPERVISOR(S) AND SUPERVISORY INFORMATION

Supervisor: ______________________    Co-Supervisor: ______________________

Supervisory Committee (For PhD students this is mandatory after their first year, optional for MSc students)

    Committee Member: ______________________
    Committee Member: ______________________
    Committee Member: ______________________

Date of last Supervisory Committee Meeting (Must meet at least once a year) :
_________________________

3. ETHICS TRAINING COURSE (Ethics training is mandatory for all graduate students)

ENG 6000: Date completed ______________
PART B – ACADEMIC PROGRESS

1. COURSE WORK - please list course numbers / grades
   1. ___________/____   2. ___________/____   3. ___________/____
   4. ___________/____   5. ___________/____   6. ___________/____
   7. ___________/____   8. ___________/____   9. ___________/____
   a. Are your program course requirement completed? YES _____ NO _____

2. SUMMARY OF RESEARCH PROGRESS (150 word maximum)
   •
   •
   •
   •

3. ACADEMIC ACHIEVEMENTS
   a. Publications - Journal Paper/Conference/Book Chapter/Patents/ Reports of Invention/ Technical Reports (For publications, add entries in the term submitted, then subsequently updated status)

<table>
<thead>
<tr>
<th>Reference – Format: Authors (year). Title. Venue. Volume, Page Numbers or # Manuscript Pages</th>
<th>Status</th>
<th>Date of last status change</th>
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<tbody>
<tr>
<td>1)</td>
<td></td>
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<tr>
<td>2)</td>
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<td>3)</td>
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</tbody>
</table>

   * Status: Under Review (UR), Accepted (A), In Press (IP), Published (P) or rejected(R)

   b. Presentations

<table>
<thead>
<tr>
<th>Reference – Format: Authors (year). Title. Venue. Date</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td></td>
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<tr>
<td>3)</td>
<td></td>
</tr>
</tbody>
</table>

c. Other Academic Achievements (e.g., scholarship, award, etc)
   •
   •
4. **TEACHING**
   a. Principal Instructor
      i. Course Number ___________________
      ii. Course Number ___________________
   b. Guest Lecturer
      i. Course Number ___________________
      ii. Course Number ___________________
   c. Teaching Assistant
      i. Course Number ___________________
      ii. Course Number ___________________
   d. Marker
      i. Course Number ___________________
      ii. Course Number ___________________
   e. Did you attend the Record of Completion Certificate? _________ . If so, indicate whether it is for Junior or Senior Certificate.

5. **OBJECTIVES FOR THE CURRENT TERM (150 word maximum)** - Briefly describe your proposed research (objectives, methodology) for the next academic year

   •
   •
   •
   •
   •

Signature: ________________________________ Date: ____________
PART C - SUPERVISOR’S EVALUATION

Please review the stated progress of the student and then, in the box below, please comment on his/her progress, contribution to publications and proposed research and return to Graduate Program Director.

Student’s Name: ___________________________   Student ID#: ______________________

Please rate this student’s performance as (circle one):

Excellent          Very Good          Good         Needs Improvement

SUPERVISOR(S)

__________________________________________ DATE: ______________________

__________________________________________ DATE: ______________________
Appendix E – New Course Proposals
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. Program: Mechanical Engineering

2. Course Number: MECH 6101

3. Credit Value: 3.0

4. Long Course Title: Microfluidics and Nanofluidics

5. Short Course Title: Microfluidics and Nanofluidics

6. Effective Session: Fall 2016

7. Calendar (Short) Course Description: Topics include: Low Reynolds number fluid dynamics; liquid and gas flows; surface tension, wetting and capillarity; thermal effects; lubrication theory; experimental methods; biofunctionalization; fabrication techniques; fluids in nanochannels.

8. Expanded Course Description:
   A) Introduction: square-cube law; length-scale in microdevices; continuum assumption; low Reynolds number hydrodynamics; gas and liquid behavior in micro-scale; Knudsen number.
   B) Liquid and Gas Flows: Governing equations; lubrication equation, compressible flow; slip flow regime; accommodation coefficients; electrokinetic flows, Examples.
   C) Surface Tension, Wetting and Capillarity: Origin of surface tension, contact angle, Young-Laplace’s equation, capillary flow, three-phase contact line, Cassie-Baxter and Wenzel states
   D) Thermal Effects: Energy equation; thermal conductivity; phonon interaction; thermal creep.
   E) Experimental Methods: Full-field methods; micro-PIV; Brownian motion, capillary driven biofunctionalization
   F) Fabrication Techniques: Subtractive techniques—etching; laser micromachining; focused ion beam
   G) Fluids in Nanochannels: Lennard–Jones potential; density distribution; validity of Navier-Stokes equation; boundary conditions.

Learning Outcomes
By the end of this course, the students should be able to:

- Apply the basic concepts and general principles of low Reynolds number hydrodynamics and solve engineering problems
- Analyze the conservation principles in fluid mechanics and formulate the equations that describe the motion both for continuum and non-continuum applications
- Apply fundamental knowledge of experimental methods to conduct micro and nanoscale flow experiments
- Apply fundamental knowledge of micro and nanofabrication for device fabrication
9. Evaluation:
The evaluation will be based on a course project and the final exam. The topic for the course project will be decided by mutual consultation between the instructor and the student. The project will be evaluated through project presentation (20 % weight) and final report submission (50 % weight). The final exam will have 30 % weight.

10. Integrated Courses:
N/A

11. Rationale:
This is an advanced graduate course in fluid dynamics exploring the role of small-scale physics towards transport of fluid. The course will also provide foundation towards fluid dynamics, which will be helpful for graduate students taking course related to fluid dynamics like ME6108 Convective Heat Transfer and ME6105 Interfacial Phenomena.

12. Faculty Resources:
This course can be offered by at least two faculty members - Sushanta Mitra and Pouya Rezai. The course will be offered once per academic year and will be part of standard teaching load for the faculty.

13. Crosslisted Courses:
N/A

14. Bibliography and Library Statement:

15. Physical Resources:
The delivery of the course involves standard class-room format lectures, which will require standard class room with capability of holding 30 students. It will also include laboratory visits, particularly for sections related to “Experimental Methods” and “Fabrication Techniques”. The appropriate laboratory would be the proposed “Advanced Manufacturing Lab” and the “Micro & Nano-scale Transport Lab” in the upcoming new Cloud building at the Lassonde School of Engineering. The class room would require standard audio/visual facilities and white board.
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. Program: Mechanical Engineering

2. Course Number: MECH 6102

3. Credit Value: 3

4. Long Course Title: Interfacial Phenomena

5. Short Course Title: Interfacial Phenomena

6. Effective Session: Fall 2015

7. Calendar (Short) Course Description:
   Topics include: Interfacial thermodynamic principles; equilibrium conditions; contact angles; capillarity and wetting; surface forces and tension; drop-surface interactions; introduction to fluid mechanics involving interfaces; interfacial measurement techniques; special topics on applications

8. Expanded Course Description:
   This course educates students in the topics at the intersection of fluid mechanics, material science, and physical chemistry. Topics include: Interfacial thermodynamic principles; equilibrium conditions; contact angles; capillarity and wetting; surface forces and tension; drop-surface interactions; introduction to fluid mechanics involving interfaces; interfacial measurement techniques; special topics on applications.

9. Evaluation:
   The course will have four components for evaluation:
   Assignments: 20%
   Midterm 20%
   Course project 25%
   Final examination 35%

10. Integrated Courses:
    N/A

11. Rationale:
    The course in Interfacial Phenomenon is a unique course within the graduate program, and very much in line with the multi-disciplinary nature of modern the graduate degree education in mechanical engineering. Specifically, this course educates students in the topics at the intersection of fluid mechanics, material science, and physical chemistry. It uses principles of thermodynamics in presenting an in depth analysis of the interfacial phenomenon. This course is in line with objectives of the graduate program to train graduate students in the focus of areas of the Mechanical Engineering graduate program which includes areas of thermodynamics, microsystems, advanced materials, fluid mechanics, and their applications to a wide array of systems and subsystems found in various machineries and devices or living organisms. Given the design of
the course and evaluation scheme that includes a project, this course will also meet the objectives of graduate program in developing communication skills of our students.

12. Faculty Resources:
The department is well positioned to offer this course as this is the speciality of Alidad Amirfazli is in this area; Another knowledgeable person in the Department is Sushanta Mitra who will be able to teach this course should the need arises. It is anticipated that this course will be offered annually once. This course does not need any particular resources beyond mounting a normal graduate course.

13. Crosslisted Courses:
N/A

14. Bibliography and Library Statement:

15. Physical Resources:
A regular classroom with A/V equipment
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. Program: Mechanical Engineering

2. Course Number: MECH 6103

3. Credit Value: 3.0

4. Long Course Title: Convective Heat Transfer

5. Short Course Title: Convective Heat Transfer

6. Effective Session: Fall 2016

7. Calendar (Short) Course Description: Topics include: Governing conservation equations; examples of formulation and solution; laminar boundary layer; integral method; turbulent heat transfer. Pre-requisites: MECH2201, MECH2202, MECH3202; and MECH3203 (or equivalent).

8. Expanded Course Description:
   A) Governing Equations: Lagrangian vs Eulerian analysis; mass conservation; momentum conservation; energy conservation; boundary conditions; species continuity equation;
   B) Examples of formulation and solution: Heat transfer during condensation; The Stefan mass diffusion problem; Boundary conditions: multi-component droplet evaporation; variable-property Couette flow; heat transfer from a hot plate to a laminar liquid film; mixed convection in a cavity with a moving lid;
   C) Laminar boundary layers: Fundamental concepts and equations; flow over plat plate; generalized formulation for flow over plane surfaces; blowing or suction at the wall; axisymmetric boundary layers; free-convection from plane bodies; forced convection from a concentrated heat source.
   D) The Integral Method: Transient Couette flow; boundary layer integral equations; flat plate with prescribed heat flux; integral method for free convection; film boiling over a vertical plate.
   E) Turbulent heat transfer: Fundamentals of turbulence; time-averaged governing equations; boundary layer equations for turbulent flows; the velocity law of wall; turbulent flow over flat plate; turbulent channel flow; temperature law of wall; turbulent Couette flow; the temperature law of wall; turbulent Couette flow; turbulent pipe flow with uniform wall heat flux; turbulent free-convection from a vertical plate; turbulent plane jet.

Learning Outcomes
By the end of this course, the students should be able to:
- Apply the basic concepts and general principles of convective heat transfer and solve engineering problems
- Analyze the conservation principles in coupled fluid and thermal problems
- Apply fundamental knowledge of scaling and order of magnitude analysis to solve complex thermal engineering problems
9. **Evaluation:**
The course will have two exams – Mid-term (50 % weight) and Take home Final (50 %).

10. **Integrated Courses:**
    
    N/A

11. **Rationale:**
    This is a foundational graduate course in Mechanical Engineering, specifically meant for students doing research in thermo-fluids area. The course will also provide foundation towards fluid dynamics, which will be helpful for graduate students taking course related to fluid dynamics like ME6103 Microfluidics and Nanofluidics and ME6105 Interfacial Phenomena.

12. **Faculty Resources:**
    Faculty members that can teach this course are Sushanta Mitra and Yadollah Maham. The course will be offered once per academic year and will be part of standard teaching load for the faculty.

13. **Crosslisted Courses:**
    N/A

14. **Bibliography and Library Statement:**

15. **Physical Resources:**
    The delivery of the course involves standard class-room format lectures, which will require standard class room with capability of holding 30 students. The class room would need to have standard audio/visual facilities and white board.
New Course Proposal Template

1. Program: Mechanical Engineering

2. Course Number: MECH 6201

3. Credit Value: 3.0

4. Long Course Title: Advanced Continuum Mechanics

5. Short Course Title: Advanced Continuum Mechanics

6. Effective Session: Fall 2015

7. Calendar (Short) Course Description:
   Topics include: Indicial notation and tensor calculus; kinematics of a continuum: material and spatial descriptions, infinitesimal strain and rotation tensors, Lagrangian and Eularian strain tensors, etc.; conservation laws; isotropic and anisotropic linearly elastic solids under small normal, torsional and bending deformations; Newtonian viscous fluids: properties interpretation, Navier-Stokes equation, analysis of special cases, etc.

   Pre-requisites: MECH2301, 2302, 2503, 3202, 3501, 3502

8. Expanded Course Description:
   The main objective of this course is to teach students the (mathematical) fundamentals of continuum mechanics and their applications to analysis of problems involving motion and deformation of linearly elastic solids and Newtonian viscous fluids. The course is designed for Mechanical Engineering graduate students, but it is also well-suited for students from Civil Engineering and Earth and Space Science and Engineering graduate programs with appropriate backgrounds.

   We will attempt to cover the course topics listed below (as time allows) from a combination of resources such as journal articles and textbooks as well as the instructor notes.
   1- Vector and Tensor Algebra and Calculus: Review with focus on Indicial Notation
   2- Kinematics of a Continuum
   3- Stress and Conservation Laws
   4- Constitutive Equations and Applications to Elastic Solid
   5- Constitutive Equations and Applications to Newtonian Viscous Fluid

Learning Outcomes
By the end of this course, the students should be able to:
   - Apply the basic concepts and general principles of tensors and indicial notations to analyze mechanics of continuum materials and to solve engineering problems
   - Interpret the notions of stress and strain tensors and clearly explain the relations of tensor components with motions and deformations of a continuum material
   - Analyze the conservation principles in the mechanics of continua and formulate the equations that describe the motion and mechanical behaviors of continuum materials
   - Assess the application of principle equations and addition of constitutive equations to problems associated with continuum elastic solids and viscous fluids
Organization and Design of the Course (Delivery Modes)
The duration of this course is 12 weeks and will be organized into two 1.5 hr-sessions per week, during which the concepts above will be taught and example problems will be solved and discussed among students and the instructor. Additional materials may be posted on the course website (e.g. Moodle) or distributed in the class as required. While the instructor will personally deliver the main concepts of the course, graduate students will be assigned to participate in teaching some of the sections that are potentially tailored towards their area of specialization (e.g. thermodynamics, fluid mechanics, vibration, etc.). Students are also expected to work on a project that involves performing research on the application of continuum mechanics to a recently-published research issue in areas such as solid and fluid mechanics, heat transfer, thermodynamics, advanced materials, biomechanics, microfluidics, control and vibration, etc. Students should submit a 500-word abstract on the 4th week of the course, proposing the subject of their projects, the main objectives, and the milestones and expected outcomes. The abstract should include citation of scholarly papers related to the research topic. The students are expected to pitch their ideas to the class in a provided 2-minute slot in a lecture session during the 4th week of class. The projects are due at the end of the course (in the last lecture) in the formats of a written manuscript (15-pages long and following the style of Continuum Mechanics and Thermodynamics Journal) and an oral presentation to the class (20 min presentation, 5 min Q&A).

To assess students learning outcomes and progress through the course, a midterm examination on the theoretical concepts will also be conducted.

Pre-requisites: MECH 2301, 2302, 2503, 3202, 3501 3502

9. Evaluation:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Breakdown (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Five on weeks 2, 4, 6, 8 &amp; 10</td>
<td>15</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>In class, open book</td>
<td>Once on week 7</td>
</tr>
<tr>
<td>Concept Teaching</td>
<td>30 minutes duration on assigned topics</td>
<td>Once on weeks 8-12</td>
</tr>
<tr>
<td>500-word Abstract</td>
<td>Once on week 4</td>
<td>5</td>
</tr>
<tr>
<td>2-min Pitch</td>
<td>Once on week 4</td>
<td>5</td>
</tr>
<tr>
<td>20-min Presentation</td>
<td>Once on week 12</td>
<td>20</td>
</tr>
<tr>
<td>Final Report</td>
<td>Once on week 12</td>
<td>20</td>
</tr>
</tbody>
</table>

10. Integrated Courses:
N/A

11. Rationale:
There is a lack of an advanced course in continuum mechanics presently offered at York University. Although most of the Mechanical (and other related) Engineering undergraduate programs provide students with the fundamental knowledge of analysing motion and deformation of solid and liquid continua, students generally suffer from lack of a deep understanding of the mathematical concepts and principals that are governing these phenomena. As discussed in section 9, the main objective of this course is to teach students the (mathematical) fundamentals of continuum mechanics and their applications to the analysis of problems involving motion and deformation of linearly elastic solids and
Newtonian viscous fluids. The course will enhance students’ depth of knowledge in core areas of Mechanical Engineering by enabling them to apply the knowledge of mathematics, sciences and engineering to address/solve a variety of Mechanical Engineering problems. It will also train them to identify advanced applications of continuum mechanics knowledge to state-of-the-art research topics and to conduct a course-level project in their fields of interest. Students’ level of communication skills will also be enhanced through this course via preparation, submission and evaluation of written reports and oral presentations. An introductory course in continuum mechanics (EATS 2470) at the undergraduate level is currently being offered by the Earth and Space Science and Engineering (ESSE) Department. This course has been taught by Pouya Rezai from Mechanical Engineering in 2014 and will also be offered by the same instructor in academic year 2015. The proposed advanced continuum mechanics course is also designed to complement the introductory EATS 2470 course and can be a useful resource for the existing ESSE graduate students.

12. Faculty Resources:
   **Course instructor:** This course can be taught by a number of faculty members at the Department of Mechanical Engineering. It will be offered by Pouya Rezai in Fall 2015. Other faculty members who have the expertise to teach this course in the future semesters are Alidad Amirfazli, Alex Czekanski and Nima Tabatabaei.
   **Course frequency:** This course will be offered once every year in the fall semester.

13. Crosslisted Courses:
   N/A

14. Bibliography and Library Statement:
   For this course, students will mostly require access to a number of textbooks and scientific articles in the journals listed below. This list has been provided to Sarah Shujeh, librarian at Steacie Science and Engineering Library for cross-referencing to the library catalogue and possible purchases and subscriptions. A confirmation statement by the University librarian is enclosed. The library also provides students with access to database resources such as Knovel, Web of Science and Engineering Village, through which students can actively conduct research and assess the development advancements in this area.

   **Useful Textbooks**

   **Useful Journals**
   - Continuum Mechanics and Thermodynamics
   - Journal of Applied Mathematics and Mechanics
   - IET Nanobiotechnol.
   - Soft Matter.
• Nanotechnology.
• J Mater Sci Mater Med
• J Biomech
• Int J Numer Method Biomed Eng
• Comput Methods Biomech Biomed Engin
• J Chem Phys.
• Lab Chip.
• Phys Rev Lett.
• J Nanosci Nanotechnol.
• J Colloid Interface Sci.
• J Biomech Eng.

15. **Physical Resources:**
The classroom required for this course should accommodate up to 15 students. The room should be equipped with standard presentation facilities (Laptop or PC with Microsoft Office Powerpoint, video, projector) and internet connection for lectures by the instructor. These resources are already available at Lassonde School of Engineering.
New Course Proposal Template

1. **Program:** Mechanical Engineering

2. **Course Number:** MECH 6202

3. **Credit Value:** 3.0

4. **Long Course Title:** Advanced Dynamics

5. **Short Course Title:** Advanced Dynamics

6. **Effective Session:** Fall 2015

7. **Calendar (Short) Course Description:**
   Topics include: Dynamic system; rigid body kinematics; rigid body kinetics; D'Alembert principle; Lagrange's Equation; variational principle, Hamilton's principle; Hamilton-Jacobi theory; stability of dynamic systems; applications to a variety of engineering problems.

   Pre-requisites: MECH 2302, 3501 and MATH 2270 (or equivalent)

8. **Expanded Course Description:**
   The main objective of this course is to teach students the advance dynamics of mass points and rigid bodies and their applications to mechanical systems. The course is designed for Mechanical Engineering graduate students, but it is also well-suited for students from Civil Engineering and Earth and Space Science and Engineering graduate programs with appropriate backgrounds.

   The topics to be covered in the course are listed below (as time allows) from a combination of resources such as textbooks, journal articles and the instructor’s notes.
   - 1- Introduction to Dynamic Systems
   - 2- Rigid Body Kinematics
   - 3- Rigid Body Kinetics
   - 4- D’Alembert Principle and Lagrange’s Equation
   - 5- Variational Principles, Hamilton’s Principle
   - 6- Hamilton-Jacobi Theory
   - 7- Stability of dynamic systems

**Learning Outcomes**

By the end of this course, the students should be able to:
(i) Formulate and solve problems using Newtonian mechanics to describe the motion of systems of particles and rigid bodies
(ii) Formulate and solve problems using D’Alembert Principle and Lagrange’s Equation to generate equations of motion for systems of particles and rigid bodies
(iii) Formulate and solve problems using Hamilton’s Principle to generate equations of motion for systems of particles and rigid bodies.
(iv) Formulate and solve problems by applying Euler’s equations to gyroscopic systems
(v) Identify, formulate and solve engineering problems arising from mechanical systems
GDLE Learning Outcomes
GDLE 1: (i)-(iv)
GDLE 3: (v)

Organization and Design of the Course (Delivery Modes)
The duration of this course is 12 weeks and will be organized into two 1.5 hr-sessions per week, during which the concepts above will be taught and example problems will be solved and discussed among students and the instructor. Additional materials may be posted on the course website (e.g. Moodle) or distributed in the class as required.

To assess students learning outcomes and progress through the course, five assignments will assigned and a midterm examination on the theoretical concepts will be conducted.

Pre-requisites: MECH 2302, 3501 and MATH 2270 (or equivalent)

9. Evaluation:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Five on weeks 2, 4, 6, 8 &amp; 10</td>
<td>20</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>In class, close book</td>
<td>30</td>
</tr>
<tr>
<td>Final Exam</td>
<td>In class, close book</td>
<td>50</td>
</tr>
</tbody>
</table>

10. Integrated Courses:
N/A

11. Rationale:
There is a lack of an advanced course in dynamics presently offered at York University. Although most of the Mechanical (and other related) Engineering undergraduate programs provide students with the fundamental knowledge of Newtonian mechanics of mass points and rigid bodies, accelerated reference frames and rotational motion, centrifugal and Coriolis forces, Lagrange’s and Euler’s equations, students generally suffer from lack of a deep understanding of the fundamental concepts and principals behind these topics. As discussed in Section 8, the main objective of this course is to teach students the advance dynamics of mass points and rigid bodies and their applications to mechanical systems. The course will enhance the depth and widen the breadth of students’ knowledge in the core areas of Mechanical Engineering by enabling them to apply the knowledge of mathematics, sciences and engineering to identify, formulate and solve a variety of Mechanical Engineering problems. It will also train them to identify advanced applications of advanced dynamics knowledge to state-of-the-art research topics.

An introductory course in dynamics (MECH 2302) at the undergraduate level is included by the Mechanical Engineering (ME) Department. In addition, an introductory and Intermediate courses in dynamics (Classic Mechanics, PHYS 2010, 3010) at the undergraduate level are currently offered by the Physics and Astronomy (PHYS) Department with emphasis on celestial mechanics annually. The proposed advanced dynamics course is designed to complement the introductory MECH 2302 and PHYS 2010, 3010 courses and can be a useful resource for the existing PHYS graduate students.

12. Faculty Resources:
**Course instructor:** This course can be taught by a number of faculty members at the Department of Mechanical Engineering. It will be offered by George Zhu in Fall 2015.

**Course frequency:** This course will be offered once every year in the fall semester.

13. Crosslisted Courses:

N/A

14. Bibliography and Library Statement:
For this course, students will mostly require access to a number of textbooks and scientific articles in the journals listed below. This list has been provided to Sarah Shujeh, librarian at Steacie Science and Engineering Library for cross-referencing to the library catalogue and possible purchases and subscriptions. A confirmation statement by the University librarian is enclosed. The library also provides students with access to database resources such as Knovel, Web of Science and Engineering Village, through which students can actively conduct research and assess the development advancements in this area.

**Useful Textbooks**

**Useful Journals**
- Nonlinear Dynamics
- International Journal Of Non-Linear Mechanics
- Multibody System Dynamics
- Journal of Multi-body Dynamics

15. Physical Resources:
The classroom required for this course should accommodate up to 15 students. The room should be equipped with standard presentation facilities (Laptop or PC with Microsoft Office Powerpoint, video, projector) and internet connection for lectures by the instructor. These resources are already available at Lassonde School of Engineering.
New Course Proposal Template

1. **Program**: Mechanical Engineering

2. **Course Number**: MECH 6301

3. **Credit Value**: 3.0

4. **Long Course Title**: The Finite Element Method in Engineering Analysis

5. **Short Course Title**: FEM in Engineering Analysis

6. **Effective Session**: Winter 2016

7. **Calendar (Short) Course Description**:

   Topics include: variational formulations and approximation for continuous systems; stiffness matrix formulations of truss and beam elements; 2D & 3D isoparametric finite elements; shell elements; FEA static analysis; steady state thermal analysis (conduction only); mass matrix formulations; vibration eigen value problems; dynamic (time domain) problems; linear solvers; verification and validation in finite element procedures.

   Pre-Req.:
   - Solid Mechanics (MECH 3502),
   - Linear Algebra (MATH 1020),
   - Differential Equations (MATH 2270)
   - Computer Programming for Engineers (CSE 1021) and

     or by instructor's permission

8. **Expanded Course Description**:

   The course is outlined in the following chapters:

   1- Fundamental Concept to Finite Elements: The variational formulations and approximation for continuous systems will be detailed including energy variational principles and Galerkin methods;
   2- 1D and 2D Truss Finite Element Methods: Stiffness matrix formulations will be derived for 1D bar and 2D truss elements. The notion of shape functions will be introduced. Force vectors and assembled stiffness matrices will be derived and used to solve truss problems;
   3- Beam Finite Element Methods: Stiffness matrix formulations will be derived for beam elements. Beam high order Hermitian shape functions will be introduced. Force vectors and assembled stiffness matrices will be derived and used to solve frame problems;
   4- 2D Isoparametric Finite Elements: 2D plane stress, plane strain and axisymmetric isoparametric FE stiffnesses will be derived. Low and high order shape functions and Jacobian will be derived. Programming aspects will be introduced in this chapter for static analysis. steady state thermal analysis (conduction only);
   5- 3D Isoparametric Finite Elements: 3D isoparametric FE stiffnesses will be derived.
   6- Steady State Thermal Analysis (Conduction only): In this chapter, thermal steady state finite element formulation for 2D and 3D problems will be derived. Effect of thermal expansion will be covered.
7- Shell Finite Elements: Stiffness matrix formulations will be derived for thin and thick shell elements. Force vectors and assembled stiffness matrices will be derived. Membrane and shear locking issues will be discussed.

8- Vibration Eigen Value Problems: Formulations of the eigen value problem will be derived. The notion of lumped versus distributed mass will be introduced. Solution to eigen value problems with the importance of mass contribution factor will be covered.

9- Dynamic (Time Domain) Problems: In this chapter, Hamilton’s principles and Euler–Lagrange formulations will be introduced. Dynamic time domain problems will be expressed using Lagrangian equation. Time marching schemes and the associated Explicit versus Implicit dynamic solutions will be derived. Dynamic stability and critical time step formulations will be discussed.

10- Verification and Validation in Finite Element Procedures: Different aspects of the finite element verification will be covered including element aspect ratio and distortion, low versus high order elements, membrane and shear locking, hourglass stability, dynamic stability and convergence issues. In addition, validation of the finite element models will be briefly discussed.

Learning Outcomes
By the end of this course, the students should be able to:
- Understand the basics of finite element method as a powerful computational mechanics tool that can be applied to real engineering problems in research and industry.
- Derive and develop finite element formulations and solutions to solve linear static and dynamic structural problems.
- Develop linear static and dynamic finite element software through the assignments.
- Apply the developed finite element software to engineering problems.
- Analyze, verify and validate finite element results related to linear static and dynamic structural problems.

Organization and Design of the Course (Delivery Modes)
The duration of this course is 12 weeks and will be organized into two lectures per week of 1.5 hour/lecture, during which finite element formulations and solution techniques will be taught. Half hour per week will be dedicated by instructor starting week (6) to discuss software implementation aspects to support assignment projects.

Lectures, midterm and assignments are scheduled as follow:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Assignments and evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction to Finite Element Methods</td>
</tr>
<tr>
<td>Week 2</td>
<td>Fundamental Concept to Finite Elements</td>
</tr>
<tr>
<td>Week 3</td>
<td>1D and 2D Truss Finite Element Methods</td>
</tr>
<tr>
<td>Week 4</td>
<td>Beam Finite Element Methods</td>
</tr>
<tr>
<td>Week 5</td>
<td>2D Isoparametric Finite Elements</td>
</tr>
<tr>
<td>Week 6</td>
<td>2D Isoparametric Finite Elements (Cont.)</td>
</tr>
<tr>
<td>Week 7</td>
<td>3D Isoparametric Finite Elements and Steady State Thermal Analysis (Conduction)</td>
</tr>
<tr>
<td>Week 8</td>
<td>Shell Finite Elements</td>
</tr>
<tr>
<td>Week 9</td>
<td>Vibration Eigen Value Problems</td>
</tr>
<tr>
<td>Week 10</td>
<td>Dynamic (Time Domain) Problems</td>
</tr>
<tr>
<td>Week 11</td>
<td>Dynamic (Time Domain) Problems</td>
</tr>
<tr>
<td>Week 12</td>
<td>Verification and Validation in Finite Element Procedures</td>
</tr>
</tbody>
</table>

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9. Evaluation:

Evaluation of this course is based on marking a midterm test, two FEA programming assignments and NO final examination, as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm: Closed Book Examination</td>
<td>15%</td>
</tr>
<tr>
<td>Assignment #1</td>
<td>45%</td>
</tr>
<tr>
<td>Assignment #2</td>
<td>40%</td>
</tr>
</tbody>
</table>

Midterm test is a closed book examination. However, important formula will be provided to the students in the last page of the midterm test paper.

All Assignments are due after three weeks from the date it is handed out, which will be notified at a later date. A report of maximum 15 pages and a copy of the developed FEA software are to be handed at the due date. 10% of mark deduction will be applied to assignments handed within two days after the assignment due date and 20% mark deduction will be applied for assignments submitted after three days of the due dates.

Final Examination: No Final Examination

10. Integrated Courses: N/A

11. Rationale:

The Finite Element Method in Engineering Analysis course is focused on the formulation and implementation of numerical solutions to governing partial differential equations of solids and their applications. With the advancement in engineering computation (hardware and software), finite element method becomes an important engineering field of study and crucial to real and complex engineering applications and other interacting multi-physics problems. This course should provide students with knowledge of a powerful numerical tool widely used in research and industry.

12. Faculty Resources: Alex Czekanski

13. Crosslisted Courses: N/A

14. Bibliography and Library Statement:

Lecture notes and course materials provided are adequate for student’s learning. Nevertheless, the following books can be used as references for the course:


15. Physical Resources:

Students will need to have access to computer lab with general mathematical programming software such FORTRAN, C, C++ and Matlab.
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. **Program**: Mechanical Engineering

2. **Course Number**: MECH6401

3. **Credit Value**: 3.0

4. **Long Course Title**: Design and Fabrication of Polymer Composites and Nanocomposites

5. **Short Course Title**: Composite and Nanocomposites

6. **Effective Session**: Fall 2015

7. **Calendar (Short) Course Description**:
   (a) *Topics include*: advantages and problems of heterogeneous materials; structure, processing, and properties of composites and nanocomposites; material selections for filler, matrix, and additives; testing and properties of composites and nanocomposites; processing technologies of composites and nanocomposites; applications of composites and nanocomposites in traditional (e.g., automotive and aerospace) and emerging areas (e.g., biomedical and energy).
   (b) **Lecture Hours**: 3.0 hours per week
   (c) **Laboratory Hours**: N/A
   (d) **Tutorial Hours**: N/A
   (e) **Pre-requisites**: MECH2301 and 3502 (or equivalent) or Consent of the Instructor
   (f) **Co-requisites**: N/A
   (g) **Crosslisting/integration**: N/A
   (h) **Max Enrolment**: 30

8. **Expanded Course Description**:
   This course presents concepts in design and fabrication of polymer composites and nanocomposites, and aims to provide a strong foundation for further studies and research on these heterogeneous materials. It will review broadly the materials used to make composites and nanocomposites, as well as various processing techniques to prepare them. The processing-structure-property relationships of polymer composites and nanocomposites are discussed to present an integrated approach to design the advanced material systems.
   Overall topics to be covered in this course are listed below:
   1) Introduction to polymers, fillers, composites, and nanocomposites;
   2) Applications of composites and nanocomposites in traditional and emerging areas;
3) State-of-the-art research in polymer composites and nanocomposites
4) Functional properties of fillers;
5) Advantages and problems of heterogeneous materials;
6) Conventional processing technologies to prepare polymer composites and nanocomposites;
7) Novel processing technologies to prepare polymer composites and nanocomposites;
8) Processing-to-structure properties of polymer composites and nanocomposites;
9) Testing and characterization techniques on fillers and composites;
10) Structure-to-property relationship of polymer composites and nanocomposites
11) Future and trends in polymer composites and nanocomposites

**Learning Outcomes**

By the end of this course, the students should be able to:

- Understand how different polymer composites and nanocomposites are used in both traditional and emerging applications.
- Know the state-of-the-art research in polymer composites and nanocomposites.
- Identify the proper processing technologies to prepare polymer composites and nanocomposites for specific properties and needs.
- Develop the processing-structure-property relationships of composites and nanocomposites.
- Understand the testing and characterization techniques on fillers and composites.

**Organization and Design of the Course (Delivery Modes)**

The duration of this course is 12 weeks. There will be two 1.5 hr-lectures per week, during which the aforementioned concepts will be learnt by students. The instructor(s) will deliver the lectures by using both PowerPoint presentations and a number of in-class discussions and/or case studies. To introduce the course material as well as to provide students with a deeper learning opportunity, project-based learning technique is followed throughout the course. This course involves a considerable amount of interactive in-class discussion and research studies. While the instructor will deliver the main concepts of the course, graduate students will be assigned to participate in delivering some concepts related to their area of specialization. A significant portion of the course marks is allocated to a major research assignment, in which the student will need to perform an in-depth literature survey to identify the technology gaps, and eventually develop an experimental plan to advance the related sciences and technology.

**9. Evaluation:**

Course evaluation would be through a presentation (10%), a major research assignment (40%), a midterm test (20%) and a final examination (30%).

**10. Integrated Courses:**

Not applicable.

**11. Rationale:**

Considering the extensive applications of composites and nanocomposites in a wide spectrum of applications (e.g., automotive, biomedical, electronic packaging, energy, … etc.), there is a need of an advanced course in the proposed Mechanical Engineering Graduate Program in
the area of composites and nanocomposites, especially in the design and fabrication of these heterogeneous materials. This course will enhance students’ knowledge in the processing-structure-property relationships of these advanced materials. Thus, it will be able to better prepare them to design, fabricate, and/or properly select the appropriate material systems to fulfill specific needs, and thereby assisting them in their thesis/dissertation research and future careers.

12. Faculty Resources:
Siu Ning Leung
This course will be offered once per two years in the winter term.

13. Crosslisted Courses:
Not applicable

14. Bibliography and Library Statement:
Books:
Klaus, F., Fakirov, S., and Zhang, Z., 2005, Polymer Composites: from nano-to-macro-scalea LITA guide, New York: Springer
Kotsikova, R., Pissis, P., 2007, Thermoset Nanocomposites for Engineering Applications, Shrewsbury: Smithers Rapra Technology

Research Papers on Polymeric Composites and Nanocomposites:
Advanced Functional Materials
Advanced Materials
Applied Physics Letters
Carbon
Composites Part A
Composites Part B
Composites Science and Technology
Journal of Applied Polymer Science
Journal of Thermoplastic Composite Materials
Macromolecular Materials and Engineering
Nanotechnology
Nano Letters
Nature Materials
Polymer
Polymer and Engineering Science
Progress in Polymer Science

15. Physical Resources:
This course involves a considerable amount of interactive in-class discussion. The classroom designated for this course should facilitate such activities. A classroom equipped with roundtables for 4-5 students for a total of 30 students will make performing such activities feasible and directly enhance students’ learning.

Standard presentation facilities such as in-class PC or a laptop with Powerpoint software, screen sharing software, as well as a projector is required for the lectures and tutorials.
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. Program: Mechanical Engineering

2. Course Number: MECH 6402

3. Credit Value: 3.0

4. Long Course Title: Smart and Multifunctional Materials

5. Short Course Title: Smart and Multifunctional Materials

6. Effective Session: Fall 2015

7. Calendar (Short) Course Description:
   (a) Topics include: Shape memory materials; electrically activated materials; magnetically activated materials; optically activated materials; chemically activated materials; structure, processing and properties of smart materials; research, development, and applications of smart materials.
   (b) Lecture Hours: 3.0 hours per week
   (c) Laboratory Hours: N/A
   (d) Tutorial Hours: N/A
   (e) Pre-requisites: Consent of the Instructor
   (f) Co-requisites: N/A
   (g) Crosslisting/integration: N/A
   (h) Max Enrolment: 30

8. Expanded Course Description:
   Smart materials are a novel class of materials that have the ability to respond to their environment in a useful manner. Such materials are developed in which material properties (e.g., electrical, mechanical, optical, etc.) can be altered to respond to external stimuli. Many of them also possess multifunctionality, making them suitable in a wide range of applications. In particular, they can exceed the current abilities of traditional materials especially in environments where conditions are constantly changing.

   Overall topics to be covered in this course are listed below:

   1) Introduction to smart and multifunctional materials;
   2) Applications of smart and multifunctional materials;
   3) Shape memory materials;
   4) Electrically activated materials;
   5) Magnetically activated materials;
   6) Optically activated materials;
   7) Chemically activated materials;
8) Structure, processing, and properties of smart materials;
9) State-of-the-art research in smart and multifunctional materials; and
10) Future and trends in smart and multifunctional materials

**Learning Outcomes**

By the end of this course, the students should be able to:

- Recognize different types of smart and multifunctional materials.
- Identify the potential applications of smart and multifunctional materials in different fields.
- Understand the principles about how different types of smart and multifunctional materials work.
- Understand the processing-structure-properties relationships of smart and multifunctional materials.
- Be aware of the state-of-the-art research in smart and multifunctional materials.

**Organization and Design of the Course (Delivery Modes)**

The duration of this course is 12 weeks. There will be two 1.5 hr-lectures per week, during which the aforementioned concepts will be learnt by students. The instructor(s) will deliver the lectures by using both PowerPoint presentations and a number of in-class discussions and/or case studies. To introduce the course material as well as to provide students with a deeper learning opportunity, project-based learning technique is followed throughout the course. This course involves a considerable amount of interactive in-class discussion and research studies. A significant portion of the course marks is allocated to a major research assignment, in which the student will need to perform an in-depth literature survey to identify the technology gaps, and eventually develop an experimental plan to advance the related sciences and technology.

**9. Evaluation:**

Course evaluation would be through a major research assignment (40%), a midterm test (20%) and a final examination (40%).

**10. Integrated Courses:**

Not applicable.

**11. Rationale:**

The ability for materials to respond to their environment in a useful manner has broad technological impact on a wide spectrum of applications (e.g., automotive, biomedical, sensing and actuation, energy, ... etc.). Thus, there is a need of an advanced course in the proposed Mechanical Engineering Graduate Program in the area of smart and multifunctional materials to expose graduate students to this novel class of materials. This course will enhance students' knowledge in the fundamentals and the applications of smart materials, preparing them to potentially incorporate these materials in their research. In other words, this course will assist graduate students in their thesis/dissertation research and future careers.

**12. Faculty Resources:**

Siu Ning Leung

This course will be offered once per two years in the winter term.
13. Crosslisted Courses:
   Not applicable

14. Bibliography and Library Statement:
   Books:
   Andreas Lendlein, and Behl, M., 2010, Shape-Memory Polymers, New York: Springer
   Chu, L.-Y., Xie, R., Ju, X.-J., and Want, W., 2013, Smart Hydrogel Functional Materials, Heidelberg: Springer
   Leng, J., and Du, S., 2010, Shape-Memory Polymers and Multifunctional Composites, Boca Raton: CRC Press

Research Papers on Polymeric Composites and Nanocomposites:
Advanced Functional Materials
Advanced Materials
Carbon
Journal of Intelligent Materials Systems and Structures
Nanotechnology
Nano Letters
Nature Materials
Progress in Polymer Science
Smart Materials Bulletin
Smart Materials and Structures
SPIE Smart Structures and Materials Proceedings
15. Physical Resources:

This course involves a considerable amount of interactive in-class discussion. The classroom designated for this course should facilitate such activities. A classroom equipped with roundtables for 4-5 students for a total of 30 students will make performing such activities feasible and directly enhance students’ learning.

Standard presentation facilities such as in-class PC or a laptop with Powerpoint software, screen sharing software, as well as a projector is required for the lectures and tutorials.
New Course Proposal

1. Program: MECHANICAL ENGINEERING

2. Course Number: MECH 6501

3. Credit Value: 3.0

4. Long Course Title: Advanced Engineering Mathematics

5. Short Course Title: Advanced Engineering Mathematics


7. Calendar (Short) Course Description:
   This core course provides mathematical techniques in the more advanced areas of mathematics that are of most relevance to engineering disciplines. Equations dealt with in the course include the Laplace equation, heat equation, wave equation, and Navier–Stokes equations. Knowledge of ordinary differential equations, linear algebra, and multivariable calculus is assumed.

8. Expanded Course Description:
   This mathematics course is designed as a core course to provide engineering graduate students with analytical skills required for their research and other graduate courses. The topics covered will include applications and properties of matrices; the eigenvalue problem; brief review of ordinary differential equations; solutions to systems of simultaneous linear differential equations using the D operator, Laplace transform, and eigenvalue methods; series solution of differential equations; formulation of partial differential equations for engineering problems; solution to partial differential equations using the separation of variables method, Sturm–Liouville theory, the method of eigenfunction expansion, Laplace transform, finite and infinite Fourier and Hankel transforms in Cartesian, cylindrical, and spherical coordinate systems. Equations dealt with in the course include the Laplace equation, heat equation, wave equation, and Navier–Stokes equations.

   Learning Outcomes
   By the end of this course, the students should be able to:
   - Mathematically model a variety of engineering problems related to their research and other graduate coursework.
   - Identify the proper mathematical approach for solving engineering problems involving partial differential equations.
   - Use the numerous examples solved in the class as aids for solving the problems in hand.
   - Use the skills obtained in the course to solve the modeled problems.
   - Find proper resources for tackling engineering mathematics problems.

   Organization and Design of the Course (Delivery Modes)
   The duration of this course is 12 weeks. The class meets 2 times a week for 2 hours. The instructor delivers the lectures by writing on the blackboard as well as PowerPoint presentations. To introduce the course material as well as to provide students with a deeper learning opportunity, problem-based learning technique is followed throughout the course. Numerous examples will be discussed in class dealing with the Laplace equation, heat equation, wave equation, and Navier–Stokes equations. The course evaluation is heavily weighted towards assignments. Assignments are designed as self-learning activities for students to carry out research on advanced engineering mathematical methods beyond the scope of the class material.
9. Evaluation:

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
<th>Breakdown (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Midterm*</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>Final*</td>
<td>1</td>
<td>35</td>
</tr>
</tbody>
</table>

* Students can bring their original lecture notes as well as the mathematical handbook of formulas and tables to the midterm and final exams.

10. Integrated Courses:
Not applicable

11. Rationale:
There is a lack of an advanced course in engineering mathematics at York University. As a result, there is no overlap between the proposed course and other courses offered in the school. Solution to partial differential equations is the main topic of the course as PDEs are building blocks of many engineering courses and engineering models, some of which are optimization of thermal systems, control of mechanical systems, finite element analysis, advanced materials science, failure theory, mechanical vibration, advanced fluid mechanics, and advanced numerical analysis.

12. Faculty Resources:
Instructor: Nima Tabatabaei
Frequency: annually

13. Crosslisted Courses:
The course is expected to become crosslisted within the engineering disciplines in near future.

14. Bibliography and Library Statement:
Lecture notes and course materials provided are adequate for student’s learning. Nevertheless, the following books can be used as references for the course:

- *Advanced engineering mathematics*, P.V. O’Neil, Cengage Learning, 2012, CT, USA
- *Advanced engineering mathematics*, K.A. Stroud, Palgrave Macmillan Ltd, 2011, NY, USA

This list has been provided to Sarah Shujeh, librarian at Steacie Science and Engineering Library for cross-referencing to the library catalogue. A confirmation statement by the University librarian is enclosed.

15. **Physical Resources:**

The course contents are delivered in sequence in a traditional classroom setting. The classroom should accommodate up to 20 students. Existing physical resources are adequate for delivery of the course.
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. **Program:** Mechanical Engineering

2. **Course Number:** ENG 6000

3. **Credit Value:** 0.0

4. **Long Course Title:** Engineering Ethics

5. **Short Course Title:** Engineering Ethics

6. **Effective Session:** Fall 2015

7. **Calendar (Short) Course Description:**
   (a) **Topics include:** Ethical responsibilities for engineering profession; academic and research integrity; technology impact on society; sustainable development and corporate citizenship; public health and safety.

   (b) **Lecture Hours:** 1.0 hr per week

   (c) **Laboratory Hours:** N/A

   (d) **Tutorial Hours:** N/A

   (e) **Duration:** 12 weeks

   (f) **Pre-requisites:** None

   (g) **Co-requisites:** N/A

   (h) **Crosslisting/integration:** N/A

   (i) **Max Enrolment:** 30

8. **Expanded Course Description:**

   The course will be delivered in form a lecture series, with the following topics and representative speakers:

<table>
<thead>
<tr>
<th>SPEAKERS</th>
<th>TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discipline Officer/Graduate Student</td>
<td>Code of Student Behaviour</td>
</tr>
<tr>
<td>Ombudsperson</td>
<td></td>
</tr>
<tr>
<td>University Student Services</td>
<td></td>
</tr>
<tr>
<td>Dean of Graduate Studies</td>
<td>Graduate Studies, Ethics and Scientific Integrity</td>
</tr>
<tr>
<td>Associate Dean, Lassonde School of Engineering</td>
<td>Professional Integrity and Student Discipline</td>
</tr>
<tr>
<td>Speaker from Bennett Jones LLP</td>
<td>Basics of Intellectual Property</td>
</tr>
<tr>
<td>Science Librarian and Teaching Commons</td>
<td>Plagiarism, Citing and Referencing Canadian Copyright on Campus</td>
</tr>
</tbody>
</table>
Learning Outcomes

By the end of this course, the students should be able to:

- Gain comprehensive knowledge on engineering ethical practises.
- Understand different aspects of plagiarism, particularly in context to digital media.
- Understand health and safety issues related to the profession.
- Understand the basic copyright, patent and discovery related to the research.

Organization and Design of the Course (Delivery Modes)

The duration of this course is 12 weeks. There will be topics covered by experts in different aspects of engineering ethics through invited guest lectures from within the university community and across the broader professional engineering community.

9. Evaluation:
The course evaluation will be done by a multiple-choice final exam, the questions for which will be obtained from different guest lecturers delivering the above mentioned topics. The final grade is either CR (credit) or NC (fail). The final grade is based on the final exam and attendance. Students are required to attend every class, late arrival is not acceptable. Attendance is taken at every class, and students must attend a minimum of 8 (from 10) classes. Students with unexcused absences will receive a grade of NC.

10. Integrated Courses:

   Not applicable.

11. Rationale:

   Typical graduate student intake in Mechanical Engineering will have large number of international students, with diverse background, who may not have taken undergraduate engineering from Canadian post-secondary institutes. It is important to re-emphasize the ethical code of conduct and general engineering ethics, which will be of great help for the students when they embark upon graduate teaching and research activities.

12. Faculty Resources:

   This course will be coordinated by the Graduate Program Director.

   This course will be offered once per year in the fall term.

13. Crosslisted Courses:

   Not applicable
14. Bibliography and Library Statement:


15. Physical Resources:
Standard presentation facilities such as in-class PC or a laptop with Powerpoint software, screen sharing software, as well as a projector is required for the lectures.
New Course Proposal Template

1. Program: Mechanical Engineering
2. Course Number: MECH 6000
3. Credit Value: 0.0
4. Long Course Title: Graduate Seminar
5. Short Course Title: Graduate Seminar
7. Calendar (Short) Course Description:
   Topics include: Research presentation event to develop and improve graduate students’ presentation skills and techniques for their future career paths and to widen the scope of their knowledge by exposing them to research topics in other areas of Mechanical Engineering to establish a sense of community.
   Pre-requisites: None
8. Expanded Course Description:
The Graduate Seminar course is a single-day research presentation event that is conducted twice annually (in June and December) at the Department of Mechanical Engineering. Participation in this course is required for all graduate students and counts towards fulfilment of their degree requirements at York University.

Learning Outcomes
The main purposes of this course is to
1- Develop and improve graduate students’ presentation skills and techniques for their future career paths and
2- To widen the scope of their knowledge by exposing them to research topics in other areas of Mechanical Engineering to establish a sense of community.

Organization and Design of the Course (Delivery Modes)
Administration: The Graduate Seminar course is a full-day event that starts at 9AM and ends at 5PM, the same day. This event will be planned by the Graduate Program Director (GPD) and the administration staff of the Department of Mechanical Engineering. It will be conducted by a number of department faculty members who will be assigned as presentation session chairs, by the GPD, and two Teaching Assistants (TAs), who will work under the chairs’ supervision. The presentation sessions are 1 hour in length and include three presentations per session.

Organization: The GPD and the admin staff of the department will be responsible for the identification of eligible presenting students (will be discussed later) each year and the submission of their names and contact information to the presentation session chairs. The responsibilities of the chair of each presentation session involves the collection of Student
Activity Reports from presenters 10 days prior to the Graduate Seminar day, the selection and invitation of two faculty members (either Supervisory Committee members or professors from other departments at York University) and one Mechanical Engineering graduate student to act as the referees of their sessions, and planning and running the session with the help of two TAs.

Student Participation: All M.A.Sc. and PhD students registered full-time at the Department of Mechanical Engineering are required to participate in this whole event. Full participation consists of successfully satisfying all the requirements listed below:

a) Annual registration in the course and attending the event in full. Attendance will be taken at each session by the chairs and TAs. A minimum of 80% attendance throughout the day is required to pass this course. If for any reason, the student is not able to attend some sessions or the entire event, he or she should contact the GPD and the chair of the session (if the student is presenting) well ahead of time.

b) Delivery of a 15-min research-related presentation followed by a 5-min question and answer session at the Graduate Seminar day. These time limits will be strictly enforced. Students whose final thesis/dissertation defenses are scheduled or who joined the program on the same semester are exempted from presenting in that semester, but are still required to register for the course and attend the event in full.

c) Presenters should work with their supervisors to prepare and submit a Student Activity Report (maximum of 10 pages) to their designated supervisory committee members at least 10 days prior to the Graduate Seminar day. The abstract (word limit of 500) of these reports will be provided to other faculty members and graduate students in the form of an e-brochure (TAs’ responsibility to produce). Previous-year coursework and research progress as well as the future plan, published journal and conference papers, and leadership and entrepreneurship activities should be discussed clearly in this report.

d) The Graduate Seminar course provides the students with an opportunity to rehearse their presentation and improve it for a subsequent Supervisory Committee meeting - that has to be planned and conducted within one month of completion of the Graduate Seminar event for all PhD students.

Preparing a presentation

Please keep the tips and recommendations below in mind when preparing your presentation and/or attending the Graduate Seminar day.

1- Your audience are perhaps interested in your work and have an academic background, but they are not necessarily experts in your field of research. So keep your presentation level at a stage that is understandable to this audience. This is of particular importance to PhD students who will have dissertation examiners and judges with minimal or even no knowledge of their topics at all.

2- Keep the timing of your presentation strictly to 15 minutes. Many details can be discussed in the 5-min Q and A session that follows each presentation, if the audience is interested.

3- Use a maximum slide numbers of 15 and a minimum font size of 18. Review your slides with your supervisor and rehearse with your fellow graduate students. Present in a loud and clear voice and face the audience when delivering your presentation.

4- Your presentation should preferably include the sections below:

a) Project: Description of the research project, current knowledge and practice and expected contributions
b) Investigation: Phenomenon under investigation, experimental setups / numerical analysis, accuracy, precision, errors, etc.

c) Analysis: Procedures and results, their accuracy and conclusions drawn

d) Conclusion: Dissemination of the research results and the expected impacts

9. Evaluation:
This course is a pass or fail course and there are three main criteria that have to be satisfied to successfully pass this course:

1- Registration in the course every year and attending 80% of the presentation sessions throughout the day.

2- Submission of a Student Activity Report to the presentation session chair 10 days prior to the event. This report will be assessed by the two faculty members who will be assigned as session referees by the chair.

3- Satisfactory delivery of a research presentation. The chairs will provide evaluation forms to the session referees. These forms will be filled during each presentation and submitted back to the chair by the end of each session. Other graduate students will also receive an evaluation form to provide feedback to each presenter. Presenters should receive a pass grade from both referees in order to pass the course.

The referees and graduate students can nominate their preferred presentations for the best presenter award on the evaluation forms. Session chairs are responsible for collection of all evaluation forms and submitting them to the Mechanical Engineering Graduate Program Office. The evaluation forms will be analyzed by TAs and assessed by the GPD to select the best Mechanical Engineering Graduate Seminar Presenter.

10. Integrated Courses:
N/A

11. Rationale:
This course currently does not exist at the Department of Mechanical Engineering. Graduate students are expected to be able to communicate their scholarly findings in many different ways. For instance, M.A.Sc and PhD students are expected to write theses and dissertations at the end of their graduate studies at York University. They are also required to present these findings in the form of a professional oral presentation at a thesis/dissertation defence session. For this purpose, the students should learn and practice a wide variety of technical and soft skills that can prepare them for delivery of competent written documents and oral presentations of their work. The Department of Mechanical Engineering takes this matter very seriously and is highly dedicated to train graduate students that are not only creative and independent researchers but also efficient communicators. In fact, one of the main objectives of the graduate program (as articulated in section 2.1 of the graduate program proposal) is for the graduated students to obtain and demonstrate the skills and abilities to “effectively deliver and communicate scholarly findings with professionals and society at large in various forms such as oral presentations (e.g. conferences and industrial forums) and disseminations (e.g. scholarly journals, patents and mass media outlets)”. In this course, the students will be provided with an opportunity to prepare a Student Activity Report and an oral presentation by working closely with their research supervisor(s). It is expected that supervisors will take responsibility for educating their graduate students in this process through provision of feedback and criticism on students’ reports and presentation slides. On the event day, the presentation sessions will
be open to graduate and undergraduate students of York University and also to other
interested attendees from industry and public. This environment can resemble what the
presenters will encounter in their future careers whether in academia or in industry.
Preparation and delivery of scholarly reports and presentations also involves commitment to
implementation of professional and ethical standards as well as sustainable practices
related to research and professional activities. For instance, the students are required to cite
related research activities in their field and to restrain from disclosure of classified
information particularly when they are working on projects with industry-based collaborators.
This is also an important objective of the proposed graduate program in Mechanical
Engineering at York University, which will be partially fulfilled by this course.

12. Faculty Resources:
Course director: This course is managed by the GPD, but should practically be coordinated
by at least six faculty members of the Department of Mechanical Engineering. The course will
be directed by Pouya Rezai in summer 2016 and all of the professors with active research
programs and graduate students at the department will be qualified to help coordinate this
course. These faculty members will be invited to participate in the delivery of this course by
acting as the presentation session referees. Some of the existing faculty members who will
contribute to this course are Sushanta Mitra, Alidad Amirfazli, Alex Czekanski, Sunny Leung,
Nima Tabatabaei, and George Zhu.
Course frequency: This course will be offered as a full-day event twice every year.

13. Crosslisted Courses:
N/A

14. Bibliography and Library Statement:
For this course, students will mostly require access to published literature in their field of
studies. York University is well advanced in this respect. The Mechanical Engineering
students have access to a host of core textbooks at the Steacie Science and Engineering
Library. The library also provides students with access to database resources such as
Knovel, Web of Science and Engineering Village, through which students can actively
conduct research and investigate the development advancements in many different
disciplines of Mechanical Engineering. The Engineering Librarians have also been very
supportive in providing faculty members with access to journal articles that York University
had not subscribed to in the past. A confirmation statement by the University librarian is
enclosed.

15. Physical Resources:
The resources required for delivery of this course are:
a) A classroom that can accommodate a minimum of 40 people, a projector and a laptop
equipped with Microsoft Office PowerPoint and Word.
b) Two TAs, 34 hrs each (16-hr material and event preparation, 10-hr event organization,
8hr evaluation)
c) Printing course abstract booklets

These resources are all available at York University. Since the course will be offered as a
single-day event in the summer, we anticipate that there will be no problem booking an
appropriate classroom with proper audio-video facilities. All the current faculty members of
the Department of Mechanical Engineering are hiring graduate students consistently every
year. For the academic year 2014-2015, the department will have at least 20 full-time
graduate students who are required to perform TA for at least 0.75 units (equivalent to
approximately 200 hrs/yr). Therefore, enough TAs will be available to deliver this course at our department.
New Course Proposal: “Legal Aspects & Governance in Engineering”

1. **Program:**
   Graduate Studies Program, Department of Mechanical Engineering, Lassonde School of Engineering

2. **Course Number:**
   ENG 6001

3. **Credit Value:**
   3.0

4. **Long Course Title:**
   “Legal Aspects & Governance in Engineering”

5. **Short Course Title:**
   “Legal Aspects & Governance in Engineering”

6. **Effective Session:**
   Fall Session, September 2015

7. **Calendar (Short) Course Description:**
   As new technologies and sub-disciplines continually emerge in the field of engineering, they give rise to many new legal issues. Through a series of learning modules, this course examines theoretical and practical intersections of law and engineering by considering the following topics: Intellectual Property; Insurance, Directors’ Liability, and Business Associations Law; International/Transnational Governance; Environmental Law; Basics of Contract Law.

8. **Expanded Course Description:**
   As new technologies and sub-disciplines continually emerge in the field of engineering, they give rise to many new legal issues. Through a series of learning modules and interactive class discussion, this course examines theoretical and practical intersections of law and engineering in a number of important areas.

   The learning modules will focus on the following topics, and will be delivered by course instructors from York University’s Osgoode Hall Law School:

   - Intellectual Property
   - Insurance, Directors’ Liability, and Business Associations Law
   - International/Transnational Governance
   - Environmental Law
   - Basics of Contract Law

   By the end of the course, students should gain an understanding of a number of key legal and governance considerations in the field of engineering that are of importance to engineering entrepreneurs, practitioners, and regulators alike.

9. **Evaluation:**
   As noted above, this course will be delivered as a series of learning modules focusing on the following topics:
At the end of each learning module, students will be evaluated by the following methods:

<table>
<thead>
<tr>
<th>Evaluation:</th>
<th>% of Final Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written in-class exam at the end of each learning module</td>
<td>5 × 10% each</td>
</tr>
<tr>
<td>Cumulative written evaluation at the end of the course through written in-class examination</td>
<td>50%</td>
</tr>
</tbody>
</table>

All course assignments and examinations will be completed within the course period.

10. Integrated Courses:
This graduate course will not be integrated with any undergraduate course at the present time. Should this change in the future, the appropriate processes will be carried out to obtain all necessary approvals at such time.

11. Rationale:
The impetus for the development of this course stems from the Lassonde School of Engineering’s philosophy that a truly great engineering education should be interdisciplinary, and should be open to the positive influences of other fields of study. As new technologies and new sub-disciplines continue to emerge in the ever-changing field of engineering, so too do they give rise to a host of new legal issues. Thus, it is critical for engineering students to gain a sound understanding of the ways in which the fields of engineering and law interact, both in theory and in practice. This course aims to provide graduate students in the Department of Mechanical Engineering with perspectives on and knowledge of the intersectionality of law and engineering with regard to a number of common ‘touch points’ between the two disciplines. The “Legal Aspects & Governance in Engineering” course will be a synergistic inter-faculty collaboration, whereby Osgoode Hall Law School will be able to assist, through the provision of knowledge and expertise, with the Lassonde School of Engineering’s vision of providing an innovative and interdisciplinary engineering education to its students, and to provide them with theoretical and practical knowledge that will become increasingly critical in fast-evolving fields of engineering practice.

12. Faculty Resources:
Dayna Scott of Osgoode Hall Law School will be the course coordinator, and the learning modules will be taught by graduate students of Osgoode Hall Law School (to be selected following approval).

It will be offered once each academic year, during the Fall session, beginning in September 2015. With regard to the course’s impact on faculty resources, a financial agreement has been reached between the Lassonde School of Engineering and Osgoode Hall Law School stipulating that the funds necessary to deliver the course – including but not limited to course instructor stipends, course materials, and physical resources – shall be provided by the Lassonde School of Engineering, while the course administrator and instructors shall be provided by Osgoode Hall Law School. In order to minimize the impact on faculty resources, individual course instructors may deliver multiple learning modules, thus mitigating the total number of course instructors required. As noted above, a total of 5 course instructors from Osgoode Hall Law School will be needed to deliver the course content and to carry out student
13. Crosslisted Courses:
This course will not be crosslisted with any other course.

14. Bibliography and Library Statement:
Though additional materials are to be selected in collaboration with the course instructors pending approval of this New Course Proposal, the following materials have been preliminarily identified:


Please see the attached statements from Sarah Shujah, Science Librarian at the Steacie Science and Engineering library, which certify that adequate library resources are available to meet all faculty, instructor, and student needs for this course.

15. Physical Resources:
This course will require minimum physical resources beyond a normal classroom or meeting room that can accommodate the course’s anticipated enrolment of approximately 15-20 students, and 5 course instructors. With regard to equipment, a projector, projection screen, and chalkboard or dry-erase board will be required.
New Course Proposal Template

The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).

1. **Program:** Mechanical Engineering

2. **Course Number:** ENG 6002

3. **Credit Value:** 3.0

4. **Long Course Title:** The Arts and Sciences of Scholarly Writing

5. **Short Course Title:** The Arts and Sciences of Scholarly Writing

6. **Effective Session:** Winter 2016

7. **Calendar (Short) Course Description:**
   (a) **Topics include:** General aspects and rhetoric of scholarly writing; presentation of research findings; writing for readers with varying levels of technical knowledge; resources for finding out about funding opportunities; characteristics of successful and unsuccessful grant proposals; review and critique proposals of your peers.
   (b) **Lecture Hours:** 3.0 hours per week
   (c) **Laboratory Hours:** N/A
   (d) **Tutorial Hours:** N/A
   (e) **Duration:** 12 weeks
   (f) **Pre-requisites:** Consent of the Instructor
   (g) **Co-requisites:** N/A
   (h) **Crosslisting/integration:** N/A
   (i) **Max Enrolment:** 30

8. **Expanded Course Description:**
   Procuring grant funding is the central key to survival for any researcher; thus, being able to write a proposal that effectively illustrates one’s ideas is essential. This course is designed specifically for graduate students to explore general strategies and tactics required to write successful grant proposals. It is intended primarily for students who are pursuing careers in academia and/or research-related careers. Overall, the course aims to enhance students’ ability to develop their proposal according to the specific criteria of funding agencies or private sector, and thereby to increase the chance of being successful in grant applications. This course involves a considerable amount of interactive in-class work and discussion. These include but not limited to invited speakers from different disciplines, faculty members of different levels in their careers, or committee members of grant evaluation committee, etc..

   Overall topics to be covered in this course are listed below:
   1) **Overview on the overall goals when writing grant proposals;**
2) Resources for finding out about funding opportunities;
3) Preparation for writing grant proposals;
4) General aspects and rhetoric of scholarly writing;
5) Organization and writing style;
6) Figures and tables;
7) Common mistakes in scholarly writing
8) Writing for readers with varying levels of technical knowledge;
9) What the grant agencies are looking for;
10) Characteristics of successful and unsuccessful grant proposals;
11) Review Process of Grant Applications; and
12) Review and critique proposals of your peers

Learning Outcomes

By the end of this course, the students should be able to:

- Identify and search for funding opportunities.
- Use strategies and tactics in the course to write successful grant proposals.
- Avoid making common mistakes in scholarly writing.
- Write for readers with varying levels of technical knowledge.
- Write a grant proposal according to the evaluation criteria of grant agencies.
- Review and critique proposals of their peers.

Organization and Design of the Course (Delivery Modes)

The duration of this course is 12 weeks. There will be two 1.5 hr-lectures per week, during which the aforementioned concepts will be learnt by students. The instructor(s) will deliver the lectures by using both PowerPoint presentations and a number of in-class writing and discussion activities. To introduce the course material as well as to provide students with a deeper learning opportunity, project-based learning technique is followed throughout the course. This course involves a considerable amount of interactive in-class work and discussion. These include but not limited to invited speakers from different disciplines, faculty members of different levels in their careers, or committee members of grant evaluation committee, etc.. The course evaluation will primarily focus on assignments and projects. Assignments will be designed as small writing and research tasks to strengthen the concepts learnt. Projects will be designed to allow students to gain experiences in writing a grant proposal as well as review and critique peers’ proposals.

9. Evaluation:
Course evaluation would be through a series of minor assignments (40%), a major review and critique report on peers’ proposals (40%), and a grant proposal (20%).

10. Integrated Courses:
Not applicable.

11. Rationale:
The writing of successful grant proposals is essential to the success of researchers and/or scientists. Another vital component of being a researcher and/or scientist is the ability to review colleagues’ work critically and constructively. Currently, there is a lack of a graduate-level course that teaches graduate students how to look for funding opportunities and write successful grant proposals in the fields of engineering and scientific research. Thus, this
course will be needed in order to better prepare the graduate students for their future research careers in either academia or industry.

12. Faculty Resources:
This course involves a considerable amount of interactive in-class work and discussion. It is recommended that each lecture will be run potentially by two instructors to facilitate such interactive work and discussion. The following are the potential instructors for this course:

- Alidad Amirfazli
- Alex Czekanski
- Siu Ning Leung
- Sushanta Mitra
- Andrew Maxwell
- Pouya Rezai
- Nima Tabatabaei
- other future faculty members

This course will be offered once per year in the winter term.

13. Crosslisted Courses:
Not applicable

14. Bibliography and Library Statement:
Books:


Yang, O.O., 2012, Guide to Effective Grant Writing: How to Write a Successful NIH Grant Application, New York; London: Springer

Online Resources:
Canada Foundation for Innovation Website (http://www.innovation.ca/)

Canadian Institutes of Health Research Website (http://www.cihr-irsc.gc.ca/e/193.html)


Mitacs Website (http://www.mitacs.ca/)

Natural Sciences and Engineering Research Council of Canada Website (http://www.nserc-crsng.gc.ca/index_eng.asp)


OWL: Purdue Online Writing Lab (http://owl.english.purdue.edu/owl)

Ontario Centres of Excellence Website (http://www.oce-ontario.org/)
Tischler, M., Scientific Writing Booklet (Source: http://cbc.arizona.edu/sites/default/files/marc/Sci-Writing.pdf)


York U Researcher Support Centre (http://www.yorku.ca/research/index.html)

15. Physical Resources:
This course involves a considerable amount of interactive in-class work and discussion. The classroom designated for this course should facilitate such activities. A classroom equipped with roundtables for 4-5 students for a total of 30 students will make performing such activities feasible and directly enhance students’ writing skills and learning.

Standard presentation facilities such as in-class PC or a laptop with Powerpoint software, screen sharing software, as well as a projector is required for the lectures and tutorials.
Appendix F - Program Requirements for Mechanical Engineering Graduate Program

The graduate program in Mechanical Engineering offers courses and opportunities for advanced studies and research leading to the degrees of Master of Applied Science (M.A.Sc) and Doctor of Philosophy (Ph.D.) in Mechanical Engineering. While the general guidelines for program requirements are listed below, specific details are found in the document Program Manual for Graduate Study in Mechanical Engineering, available online from the Department website along with details regarding current active research areas in the Department.

Master of Applied Science Program

ADMISSION REQUIREMENTS

Graduates with an honours undergraduate degree or equivalent (typically a four-year program with full-time enrolment) from an accredited university, with at least a B average in the last two years of study, may be admitted as candidates for the Master of Applied Science program in mechanical engineering. The following are the minimum English Language test scores (if required): TOEFL 233/577 or YELT 4.

DEGREE REQUIREMENTS

Candidates for the M.A.Sc degree in mechanical engineering must complete four graduate three-credit courses, two compulsory non-credit courses (ENG 6000 Engineering Ethics and MECH 6000 Graduate Seminar Series), and write and successfully defend a master’s thesis.

TIME REQUIREMENTS

Students are expected to complete all of their master’s degree requirements in no more than 12 terms (4 years) of registration as a full-time or part-time Master’s student, in accordance with Faculty of Graduate Studies Registration Policies, including the requirement of continuous registration.

Doctor of Philosophy Program

ADMISSION REQUIREMENTS

Applicants must have a graduate degree (M.A.Sc or equivalent) from relevant Engineering programs (e.g., Mechanical Engineering, Material Engineering, Electrical Engineering) or Sciences programs (e.g., Physics, Chemistry, Biology). A minimum average grade of B on all course work is required. Outstanding applicants with undergraduate degree in mechanical engineering will also be considered for direct admission to Ph.D. program in Mechanical Engineering. The following are the minimum English Language test scores (if required): TOEFL 233/577 or YELT 4.

DEGREE REQUIREMENTS

Candidates for the Ph.D. degree in mechanical engineering must complete four graduate three-credit courses, two compulsory non-credit courses (ENG 6000 Engineering Ethics and MECH 6000 Graduate Seminar Series), and write and successfully defend a doctoral thesis. Candidates who do not have a master’s degree would require to take two additional graduate three-credit courses. Candidates must successfully complete a
Ph.D. comprehensive examination consisting of a written report on the candidate’s field of interest and have an oral defense of the report.

TIME REQUIREMENTS

Students are expected to complete all of their doctoral degree requirements in no more than 12 terms (4 years) of registration as a full-time or part-time Master’s student, in accordance with Faculty of Graduate Studies Registration Policies, including the requirement of continuous registration.
Appendix G – Support Letters
MEMO
FROM THE OFFICE OF THE CHAIR
DEPARTMENT OF MECHANICAL ENGINEERING

TO: Sushanta Mitra, Chair, Department of Mechanical Engineering
FROM: Janusz Kozinski, Dean, Lassonde School of Engineering
SUBJECT: Graduate Programs in Mechanical Engineering
DATE: December 19, 2014

It gives me great pleasure to offer my enthusiastic support for the proposed new graduate program in Mechanical Engineering, offering master and doctoral study. These new programs play a pivotal role in the series of new programs that the Lassonde School of Engineering will be introducing under its transformative plans for engineering at York. It represents a natural next step in the expansion of York’s Department of Mechanical Engineering.

I was pleased to read Dr. Deen and Dr. Chandra’s very positive review of the Graduate Program Proposal in Mechanical Engineering. In particular I appreciate their comments about the high quality of aligned learning outcomes with degree level expectations, the strong and timely demand for new graduate programs in Mechanical Engineering, and the excellent expertise possessed by our faculty members. Cited as “highly commendable” and as “key distinguishing features” of our proposed graduate program are a commitment to train “Renaissance Engineers™ – entrepreneurial engineers with a social conscience and a sense of global citizenship,” and our goal of exposing students to important complementary areas, such as engineering pedagogy, technology transfer and commercialization, legal aspects, communications, intellectual property as well as professional, ethical, and environmental obligations, etc. The relatively few areas for improvement suggested by the reviewers have been addressed in the revised proposal, together with the feedback arising from collegial discussion within the Faculty.

The program development was informed by a careful planning phase, involving consultations with internal colleagues, external consultants and expert colleagues as well as benchmarking against leading Mechanical Engineering programs in Canada and the US. The initiative is fully aligned with the strategic directions of the Lassonde School of Engineering and the University. Our strategic planning envisions a multi-phase development for Engineering at York, in which Mechanical Engineering features prominently as a cornerstone. The proposal is also aligned with the principal goals of the most recent University Academic Plan and the Provostial White Paper, which call for expansion of the scope of the University’s teaching and research activities in the areas of engineering and applied science.

The resources for the new graduate program in Mechanical Engineering have been developed in the context of the larger planning exercise for the expansion of Engineering at York. The academic financial resources and planning processes will be subject to a very stringent planning and accountability framework, as would be expected of any project of the magnitude and size as envisioned by the Lassonde School of Engineering.

Plans for faculty complement and enrollment growth have been developed to strike the essential balance between professional and academic standards, with the average student-to-faculty ratios aligning with comparable programs of similar size. Resources for the appropriate administrative, technical and student support staff have already been built into the plans for expansion and will be allocated as the new program comes online.

In conclusion, I am pleased to offer my strong support for the introduction of master’s and doctoral study in Mechanical Engineering into the Lassonde School of Engineering.

Cc: S. Pagiatakis, Associate Dean, Research & Graduate Studies
Memorandum

To: Rebecca Pillai Riddell, Chair, Senate APPRC

From: Rhonda Lenton, Provost

Date: November 26, 2014

Subject: Proposal for Graduate Programs in Mechanical Engineering

I have undertaken an initial review of the proposal from the Lassonde School of Engineering to establish graduate programs — the MASc and PhD — in Mechanical Engineering. It is my intention to provide a more detailed statement with regard to this proposal following receipt of the reviewer’s report, the Department’s response, and the final version of the proposal incorporating any revisions to take account of the reviewer’s comments. At this stage, however, let me signal that I am fully satisfied that this proposal should go forward for consideration by the external reviewer.

The proposal is consistent with LSE’s plans to broaden the range of its programs as set out in proposals for its establishment, and represents the next phase in its development. It also aligns with institutional priorities (as expressed in the UAP, the White Paper, and the Strategic Mandate Agreement) in relation to the growth of graduate programming and enrolments and enhancing York’s comprehensiveness through expansion of the sciences and engineering. Finally, it is consistent with Ontario government objectives around increasing the number of graduate spaces in Ontario universities.

Since its launch in 2012, LSE has been implementing plans for growth and program development, within the Faculty’s vision of the “Renaissance Engineer”. The current proposal builds on a strong undergraduate program in Mechanical Engineering initiated in the Fall of 2014. The plan is to introduce the graduate programs in 2015 with an initial intake of 20 students. The Faculty has also articulated plans to build its faculty complement to support programming, and since January 2013, seven faculty members have been hired in Mechanical Engineering, with further complement growth planned as enrolments increase.

Cc: Dean J. Kozinski
C. Underhill for ASCP
Memorandum

To: Dean Janusz Kozinski, Lassonde School of Engineering

Date: November 27, 2014

From: Don Hunt, University Registrar

Subject: Proposal for a Masters of Applied Science and a Doctoral Program in Mechanical Engineering

I am writing in response to the proposal as noted above. The Registrar’s Office supports a Masters of Applied Science and a Doctoral Program in Mechanical Engineering with the following recommendation:

- The course rubric is to be amended to consistently reflect the rubric. As presented, the proposal uses ME in some cases and MECH is others.

At this time, there may still be some operational challenges to be addressed; however we look forward to working collaboratively through any implementation issues not foreseen in the review of this proposal.

Thank you for the opportunity to review and comment.

Don Hunt
York University
University Registrar
phone: 416-736-2100 ext 70704
fax: 416-650-8124

Partners in Student Success
TO            Sushanta Mitra, Chair, Department of Mechanical Engineering
FROM          Janusz Kozinski, Dean, Lassonde School of Engineering
SUBJECT       Graduate Programs in Mechanical Engineering
DATE          Thursday, November 20, 2014

It gives me great pleasure to offer my enthusiastic support for the proposal for a new graduate program in Mechanical Engineering, offering master's and doctoral study. These new programs play a pivotal role in the series of new programs that the Lassonde School of Engineering will be introducing under its transformative plans for engineering at York. It represents a natural next step in the expansion of York's Department of Mechanical Engineering.

The program development was informed by a careful planning phase, involving consultations with internal colleagues, external consultants and expert colleagues, as well as benchmarking against leading Mechanical Engineering programs in Canada and the US. The initiative is fully aligned with the strategic directions of the Lassonde School of Engineering and the University. Our strategic planning envisions a multi-phase development for Engineering at York, in which Mechanical Engineering features prominently as a cornerstone. The proposal is also aligned with the principal goals of the most recent University Academic Plan and the Provostial White Paper, which call for expansion of the scope of the University's teaching and research activities in the areas of engineering and applied science.

The resources for the new graduate program in Mechanical Engineering have been developed in the context of the larger planning exercise for the expansion of Engineering at York. The academic financial resources and planning processes will be subject to a very stringent planning and accountability framework, as would be expected with any project of the magnitude and size as envisioned for the Lassonde School of Engineering.

Plans for faculty complement and enrollment growth have been developed to strike the essential balance between professional and academic standards, with the average student-to-faculty ratios aligning with comparable programs of similar size. Resources for the appropriate administrative, technical and student support staff have already been built into the plans for expansion and will be allocated as the new program comes online.

In conclusion, I am pleased to offer my strong support for the introduction of master's and doctoral study in Mechanical Engineering into the Lassonde School of Engineering.

Cc:            S. Pagatakas
Memo

To: Dr. Sushanta Mitra  
   Chair, Department of Mechanical Engineering  
   Lassonde School of Engineering

From: Catherine Davidson, Interim University Librarian

Date: September 10, 2014

Subject: Library Support for Proposed Program in Mechanical Engineering

York University Libraries has a record of providing strong library services and collections in support of research and academic studies at York. It is our goal to provide the same high level of library support and expertise to the faculty and students in mechanical engineering. Resources will need to be targeted to build collections, expand expertise relevant to engineering and provide library study spaces conducive to the new curriculum. We look forward to collaborating with others on campus to make York's program in Mechanical Engineering one of the best in Canada.

Student academic success is a priority for the Libraries. Librarians can improve student academic success through the delivery of workshops and classes on library research in the internet world including critical thinking skills to evaluate the vast amounts of information. At York's libraries, students can get assistance with their literature research, improving their writing skills and acquiring more effective learning skills both in the library and online. Librarians with expertise in Science and Engineering at Steacie Science & Engineering Library will work with students so they may effectively conduct research on topics of capstone projects as well as find background information for internships and coop assignments.

Students and faculty in engineering expect to have online access to information anywhere and anytime. York University Libraries has strong digital collections in electrical engineering along with most of the basic online engineering resources. We have been working closely with Engineering colleagues over the past year to identify new resources that will need to be acquired including ejournals, standards, books, and reference databases that are particularly relevant to the new program in mechanical engineering at the Lassonde School of Engineering.

cc: Sarah Shujah, Science Librarian  
   Ilo Maimets, Head, Steacie Science & Engineering Library  
   Adam Taves, Associate University Librarian, Collections and Research
November 6, 2014

Dr. Janusz Koziniski
Dean, Lassonde School of Engineering
150B Atkinson College
York University
4700 Keele Street
Toronto, Ontario, M3J 1P3
Canada

Dear Dr. Koziniski,

Re: New Course Proposal: “Legal Aspects & Governance in Engineering”

Please find enclosed with this Letter of Support the New Course Proposal for a graduate course entitled “Legal Aspects & Governance in Engineering”, to be offered by the Mechanical Engineering Department at the Lassonde School of Engineering, in collaboration with Osgoode Hall Law School.

By way of background, the impetus for the development of this course stems from the Lassonde School of Engineering’s philosophy that a truly great engineering education should be interdisciplinary, and should be open to the positive influences of other fields of study. As new technologies and new sub-disciplines continue to emerge in the ever-changing field of engineering, so too do they give rise to a host of new legal issues. Thus, it is critical for engineering students to gain a sound understanding of the ways in which the fields of engineering and law interact, both in theory and in practice. To that end, Osgoode Hall Law School has agreed to partner with the Lassonde School of Engineering to assist in the delivery of this course in order to provide graduate students in the Department of Mechanical Engineering with perspectives on the intersectionality of law and engineering with regard to a number of common ‘touch points’ between the two disciplines.

As you will note from the New Course Proposal, the course will be listed as a graduate-level Engineering course under the course code ENG 6001 at the Lassonde School of Engineering. It will be structured as a series of learning modules that will be delivered by Osgoode Hall Law School over the duration of the Fall Session, beginning in September 2015. By way of structure and content, the first week of the course will be used for introduction of the course instructors and for an overview of the course. Each subsequent two-week period of the course will be used to deliver one learning module. The proposed learning modules shall include the following topics:

- Intellectual Property
- Insurance, Directors’ Liability, and Business Associations Law
• International/Transnational Governance
• Environmental Law
• Basics of Contract Law

With regard to the course’s impact on faculty resources, I am pleased to confirm that the Lassonde School of Engineering has committed to financially support the course including but not limited to course instructor salaries and benefits, course materials, and physical resources. The course administrator and instructors shall be provided by Osgoode Hall Law School. In order to minimize the impact on faculty resources, individual course instructors may deliver multiple learning modules, thus mitigating the total number of course instructors required.

As outlined in the New Course Proposal, all necessary consultations have been carried out with the relevant York University library personnel, and arrangements shall be made to carry the relevant course materials at the Lassonde School of Engineering’s library.

We believe that the “Legal Aspects & Governance in Engineering” course represents a very positive effort to encourage inter-faculty synergy, whereby Osgoode Hall Law School will be able to assist, through the provision of knowledge and expertise, with the Lassonde School of Engineering’s vision of providing an innovative and interdisciplinary engineering education to its students.

Should you have any questions or require any clarification, please feel free to contact Dr. Dayna Scott at Osgoode Hall Law School, or Dr. Sushanta Mitra at the Lassonde School of Engineering.

Sincerely,

Dr. Lorne Sossin
Dean, Osgoode Hall Law School

cc. Professor Dayna Scott
Phyllis Lepore Babcock
Dear Dean Kozinski

Alex Czekanski has asked me to let you know that a graduate course I teach is available to students. This is EDU5414 Teaching and Learning in Post Secondary Education. The details can be found on the Faculty of Education website: http://edu.yorku.ca/academic-programs/graduate-studies/courses/

Education 5414 Cr=3.0: Teaching and Learning in Post-Secondary Education
This course examines traditional and emerging approaches to teaching and learning in post-secondary education. It explores the development of teaching methodologies in colleges and universities in Canada and other international venues. In particular students are encouraged to critically evaluate traditional methods and explore one or more selected methodology in the form of a review, group presentation and reflective paper.

All the best
Celia

Celia Popovic • Director
Teaching Commons

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