Lakehead
UNIVERSITY

FACULTY OF GRADUATE STUDIES
Phone: (807) 343-8099
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Date: Tuesday, May 7, 2013

To: Faculty of Graduate Studies Council

From: Philip Hicks, Dean

Subject: **Report to Senate – May 7 Meeting**

The following recommendations were approved at the May 7, 2013 meeting of the Faculty of Graduate Studies Council (FGSC).

MSc, Mechanical Engineering	Calendar Entry, New Program (attached)	The FGSC recommends Senate approves the calendar submission
PhD, Electrical & Computer Engineering	Calendar Entry, New Program (attached)	The FGSC recommends Senate approves the calendar submission, with minor changes
MPH	Calendar changes (attached)	The FGSC recommends that Senate approves, with minor changes. NOTE: The addition of the Thesis Route to the Nursing Specialization option has been deferred. As a Major Modification it requires QA approval.
Motion from April 9, 2013 meeting of FGSC	Moved by A. Mallik, seconded by J. Pukila: "that the current cap of 25 international Graduate Assistantships be removed"	CARRIED, with two Opposed

L. Hill

Request for Calendar Change Form

Tracking No:
(Senate Secretary's Office use only)
Date:

To Secretary of Senate

From

Name(Dean):	Faculty
Dr. David Barnett	Engineering

Department the change relates to

Mechanical Engineering

Contact Person

Dr. Wilson Wang

Is the proposed calendar change Graduate

Instructions:

1. In all cases please complete and attach section 1 and 2
2. If the calendar change affect other departments/schools/faculties complete and attach section 3
3. If the answer to any of the questions below is yes, explain. Attach separate sheets with reference to the question

	Yes	No
1. Do the proposed changes affect other departments/ schools/faculties in terms of their calendar change?	☑	☐
2. Is a transition plan needed for student in progress?	☐	☑
3. Are the proposed changes likely to affect student enrollment in your department/school/faculty?	☑	☐
4. Are the proposed changes likely to affect student enrollment in other departments/schools/faculties at Lakehead University?	☐	☑
5. Will the proposed changes require additional teaching space and/or teaching staff and/or equipment and/or other resources?	☐	☑
6 Will the proposed changes affect existing teaching loads within your department/school/faculty?	☐	☑
7. Will the proposed changes increase demand for teaching support services such as the library, computing services and technical staff ?	☐	☑
8. Will the proposed change require direct or in-kind support from outside the academic unit?	☐	☑
9. Do the proposed changes include change in course(s) which is/are required core course(s) for a major?	☐	☑
10. Do the proposed changes include a change in course which is	Yes	No

service/required course(s) in another program?	☐	☑
11. Do the proposed changes include change in course(s) which is/are open elective available to any student in any program?	Yes ☐	No ☑
12. Do the proposed changes include change in course(s) which is/are elective in a major i.e. restricted to students in a major?	Yes ☐	No ☑

Signatures:

Date approved by faculty council
07/10/2011

Section 1

Description of the Proposed Calendar Change:

New Program Entry MSc Mechanical Engineering

Rationale of the Proposed Calendar Change(s):
(Corresponding to Section 2 where required)

1

New Program MSc Mechanical Engineering previously approved by Senate on November 23, 2012. Final Calendar Submission.

Section 2	
Existing Calendar Entries: (Page reference based on hard copy or URL based on electronic version of calendar)	Proposed Calendar Entries/Addition/ Deletion -If only addition, specify page number and placement in university calendar -If only deletion, write Deleted

Professor and Dean: D.W. Barnett

MSC (MECHANICAL ENGINEERING)

Graduate Coordinator: W. Wang

Core: Master's
H. Bai
B. Ismail
K. Liu
M. Liu
X. P. Liu (Electrical Engineering)
M. Roy
B. Singh
S. Siddiqui
A. Tayebi (Electrical Engineering)
W. Wang

MSC IN MECHANICAL ENGINEERING
The MSc in Mechanical Engineering satisfies the demand in academia and industry for highly-qualified personnel in the field of Mechanical Engineering. The program is directed to graduates from the existing undergraduate program in Mechanical Engineering at Lakehead University and graduates from undergraduate programs at other universities. The program fosters independent research and development abilities of students. These objectives are achieved through a combination of formal course study and thesis work.

ADMISSION REQUIREMENTS
Candidates are accepted under the Admission Requirements of the Faculty of Graduate Studies Master's Regulations provided that the requirements of the Faculty of Engineering are also satisfied.

To be considered for admission to the MSc program in Mechanical Engineering, the applicant must normally hold a Bachelor's Degree in

Mechanical Engineering or other equivalent four-year programs, in addition to all other general admission requirements of the University.

A make-up period of study, as recommended by the Engineering Graduate Studies Committee, may be required where the student is deficient in background undergraduate level courses. Proficiency in the English language is required. Meeting the minimum requirements does not necessarily lead to automatic admission, but depends on the availability of places in the program and on an assessment by the Engineering Graduate Studies Committee of the applicant's aptitude for graduate studies and research.

The application deadline is February 1. Late applications will be considered for admission, but may not be eligible for funding.

ACADEMIC REGULATIONS
In addition to the Faculty of Graduate Studies Master's Regulations of this calendar, Engineering students are also bound by the regulations listed below.

Course Substitution
For MSc in Mechanical Engineering, one of the four half-courses of the program may be taken from another existing graduate program at Lakehead University. A student can take only one graduate reading course under Engineering 5671: Advanced Topics in Mechanical Engineering to be credited as a half-course. One of the four half-courses may be a senior undergraduate half-course that has not previously been taken. The student's choice of courses must be approved by the graduate supervisor and the Graduate Program Coordinator.

Minimum Satisfactory Academic Standing
All graduate students must obtain a minimum mark of 70% in each half-course. A score of less than 70% will constitute a failure. A failed half-course may be repeated or replaced by another course specified by the supervisor only once. Any students with more than one half-course failure on his/her record must withdraw from the program.

Thesis Supervision and Examination
The student will be guided by a thesis supervisor and a supervisory committee to be established by the end of the first term after enrolment. A

research thesis topic should be submitted to the student's thesis supervisor by the end of the second term of studies. When completed, the thesis will be examined under university regulations (see Faculty of Graduate Studies Master's Regulations).

PROGRAM

MSC IN MECHANICAL ENGINEERING
The requirements for the MSc in Mechanical Engineering (total 5 FCEs) are:
four half-courses (2 FCEs) of which at least two must be chosen from core courses and at least one must be chosen from elective courses, as specified below
the graduate seminar, Engineering 5771 (carries 0.5 FCE credit weight)
the graduate thesis, Engineering 5901 (9901) (carries 2.5 FCE credit weight)

Graduate Core Courses:
All students must take two of the following four core half-courses:
Engineering 5171 - Computational Mechanics
Engineering 5172 - Advanced Thermal-Fluids
Engineering 5173 - Intelligent Tools for Engineering Applications
Engineering 5174 - Modeling and Control of Mechanical Systems

At least two core half-courses will be offered each year, and all four core half-courses will be offered in the period of two years.

Graduate Elective Courses:
All students must take at least one of the following elective half-courses:
Engineering 5175 - Applied Elasticity
Engineering 5271 - Alternative Energy Engineering
Engineering 5272 - Combustion and Emissions in IC Engines
Engineering 5273 - Mechatronics
Engineering 5274 - Advanced Manufacturing
Engineering 5275 - Mechanical Systems and Signal Processing
Engineering 5371 - Vibration Theory and Applications
Engineering 5671 - Advanced Topics in Mechanical Engineering

At least two elective half-courses will be offered each year.

ENGINEERING GRADUATE COURSES

Engineering 5171
Computational Mechanics

Credit Weight:
0.5

Description:
Least squares and the conjugate gradient method; approximation and interpolation; fast Fourier transform; numerical solution of non-linear equations; optimization; initial value problems; boundary-value problems; finite difference and finite element methods.

Offering:
3-1.5; or 3-1.5

Engineering 5172
Advanced Thermal-Fluids

Credit Weight:
0.5

Description:
Advanced heat conduction, convection, and thermal radiation; analytical heat transfer; the second law of thermodynamics and entropy generation; exergy; exergo-economics; conservation equations for viscous fluids & boundary layer concept; Navier-Stokes equations; and compressible 1-D flows.

Offering:
3-1.5; or 3-1.5

Engineering 5173
Intelligent Tools for Engineering Applications

Credit Weight:
0.5

Description:
Computational intelligence; fuzzy logic; neural networks; genetic algorithms; hybrid techniques such as neuro-fuzzy schemes; machine learning; softcomputing in engineering applications in system modeling, pattern classification and control.

Offering:
3-1.5; or 3-1.5

Engineering 5174
Modeling and Control of Mechanical Systems

Credit Weight:
0.5

Description:
Modelling of mechanical, electrical, thermal, and fluid dynamic systems; state space analysis; controllability, observability and stability; state feedback, output feedback, modal control; introduction to adaptive control, self-tuning regulations, and model reference adaptive systems.

Offering:
3-1.5; or 3-1.5

Engineering 5175
Applied Elasticity

Credit Weight:
0.5

Description:
Introduction to rectangular cartesian tensors; development of equations of classical linear elasticity; applications to plane and torsion problems; exact and approximate analytical methods.

Offering:
3-1.5; or 3-1.5

Engineering 5271
Alternative Energy Engineering

Credit Weight:
0.5

Description:
Alternative clean and renewable energy sources (solar, wind, geothermal, and hydro energy); thermoelectric systems; fuel cells; nuclear energy; cogeneration; waste-heat recovery; energy storage, sustainability, and economics; and GHG emissions, pollution, and global warming.

Offering:
3-1.5; or 3-1.5

Engineering 5272
Combustion and Emissions in IC Engines

Credit Weight:
0.5

Description:
Properties of fuels; combustion of fuels; stoichiometric combustion; analysis of flue gas; pollutant formation and control in IC engines; hydrogen combustion in IC engine; combined heat and power (CHP); analysis of CHP; biofuels combustion.

Offering:
3-1.5; or 3-1.5

Engineering 5273
Mechatronics

Credit Weight:
0.5

Description:
Properties of linear and nonlinear systems; system identification methods; modelling and approximation of dynamic systems; sensor and actuators; computer interfacing; computer control of machines and processes (PLC and PC based).

Offering:
3-1.5; or 3-1.5

Engineering 5274
Advanced Manufacturing

Credit Weight:
0.5

Description:
Solid modeling theory; part creation; assemblies and rigid bodies; mechanism simulation; optimization of manufacturing processes; graphical modeling of milling and turning; B-splines; data exchange; CNC machining and inspection.

Offering:
3-1.5; or 3-1.5

Engineering 5275
Mechanical Systems and Signal Analysis

Credit Weight:
0.5

Description:
Data representation; signal conditioning; error analysis; sampling characteristics; deterministic and random signal analysis; statistical analysis; digital filters; fault detection in general mechanical systems such as gears, bearings, and shafts.

Offering:
3-1.5; or 3-1.5

Engineering 5371
Vibration Theory and Applications

Credit Weight:
0.5

Description:
Single and multiple DOF systems; eigenvalue problems; impedance and mobility of dynamic systems; modal analysis; orthogonality and frequency response functions; experimental modal analysis; vibration control.

Offering:
3-1.5; or 3-1.5

Engineering 5671
Advanced Topics in Mechanical Engineering

Credit Weight:
0.5

Description:
Current developments and specialized topics in Mechanical Engineering.

Special Topic:
Y

Offering:
3-0; or 3-0;

Engineering 5771
Seminar Mechanical Engineering

Credit Weight:
0.5

	Description: An ordered and critical exposition of the literature on an appropriate topic in mechanical engineering. Offering: 1-0; or 1-0 Notes: May only be taken by students in Mechanical Engineering.

Section 3

The Faculty(ies) affected by the proposed calendar change

Faculty of Graduate Studies

I have been consulted regarding the attached calendar change and understand the academic and budgetary implication on my Dept./School/Faculty.

I agree to this calendar change proposal Yes ☐ No ☐

Final Calendar Submission

Name:

Faculty:

Date:

Signature of Dean

Appendix E: Draft Calendar Entry (as of January 9th, 2013)

Doctor of Philosophy (PhD) in Electrical and Computer Engineering

Graduate Co-ordinator: R. Khoury

Core: Doctoral Supervisory:
A. Tayebi (Electrical Engineering)
M. N. Uddin (Electrical Engineering)
X. P. Liu (Electrical Engineering)
D. Alexandrov (Electrical Engineering)
C. Christoffersen (Electrical Engineering)
H. Naser (Software Engineering)
R. Benlamri (Software Engineering)
N.-Y. Yu (Electrical Engineering)
A. Manzak (Electrical Engineering)
E. Atoofian (Electrical Engineering)
R. Khoury (Software Engineering)
K. Liu (Mechanical Engineering)
W. Wang (Mechanical Engineering)
S. Pichardo (Adjunct, Electrical Engineering)
L. Curiel (Adjunct, Electrical Engineering)

DOCTOR OF PHILOSOPHY (PHD) IN ELECTRICAL AND COMPUTER ENGINEERING

The PhD in Electrical and Computer Engineering satisfies the demand in academia and industry for highly qualified personnel in the field of Electrical and Computer Engineering. The program is directed to graduates from the existing Master's **programs** in Engineering ~~programs~~ at Lakehead University and outstanding graduates at the post graduate level from other universities.

The objective of the program is to foster students' scholarly skills and independent research abilities through a combination of formal course work and dissertation (research) work.

The areas of specialization in the proposed program are Electrical Engineering, Computer Engineering, Software Engineering, and Mechatronics. The first three are well-established disciplines. The fourth, Mechatronics, is a new but increasingly important area that overlaps the three first disciplines and Mechanical Engineering.

ADMISSION REQUIREMENTS

Candidates are accepted under the ~~general~~ **Faculty of Graduate Studies doctoral** ~~University~~ regulations governing the graduate degrees, provided that the requirements

of the Faculty of Engineering are also satisfied.

The applicant must hold an MSc degree in Electrical and Computer Engineering or a closely-related area with ~~at least~~ a **minimum** 70% average. Admission is dependent on the past academic history of the candidate and the assessment of the referees, the availability of space in the program and the availability and willingness of a suitable faculty member to supervise the applicant. A supervisor must be identified before the student is admitted to the program.

ACADEMIC REGULATIONS

In addition to the Faculty of Graduate Studies PhD regulations, the following regulations apply to the PhD in Electrical and Computer Engineering program.

(a) Course Requirements

It is expected that the student will maintain a minimum cumulative average of **70% (B)** ~~B~~ in the course work and a minimal final mark of 70% in each individual course.

The student choice of courses must be approved by the graduate supervisor and the Engineering Graduate Studies Committee.

A minimum of three half-credit graduate courses beyond the Master's level are normally completed within the first year of registration. To satisfy the program requirements, the three half-credit courses must comply with the following regulations:

1. They must be three half-credit graduate-level ~~Electrical and Computer Engineering~~ courses that have not been taken previously ~~at the Master's level~~.
2. No more than one course can be a relevant graduate-level course selected from outside the List of Electrical and Computer Engineering Graduate Courses.
3. No more than one "Advanced Topics in Electrical and Computer Engineering" (ENGI 5631) course with the student's supervisor will be accepted as a half-credit course.

In addition to the three half-credit courses, students must take the "PhD Seminar" (ENGI 6710) course. This seminar is normally taken in the second year of the PhD program.

List of Electrical and Computer Engineering Graduate Courses:

ENGI 5131: Microelectronics
ENGI 5132: Digital Communication Systems
ENGI 5231: Computer Architecture
ENGI 5232: Software Construction and Evolution
ENGI 5431: Advanced Power Electronics

ENGI 5432: Semiconductor devices
ENGI 5433: Design of RF ICs
ENGI 5434: Wireless Communication Systems
ENGI 5331: Digital ASIC Design
ENGI 5332: Advanced Computer Engineering
ENGI 5333: Computer Networks
ENGI 5334: Web Engineering
ENGI 5111: Control Engineering Concepts
ENGI 5211: Robust Control
ENGI 5411: Intelligent Control
ENGI 5631: Advanced Topics in Electrical and Computer Engineering
ENGI 5732: Nonlinear Control
ENGI 5733: Robotics
ENGI 5734: Natural Language Processing
ENGI 5735: Advances in Semiconductor Materials
ENGI 5736: Nanostructured Materials
ENGI 5273: Mechatronics
~~CS~~ **COMP** 5313: Artificial Intelligence

(b) Research Supervision

Each student will be assigned a supervisor, (and optionally a co-supervisor) at the point of admission by the Engineering Graduate Studies and Research Committee. Supervision of all graduate students will be provided by their supervisor. Students are required to report their progress to their supervisor on a mutually agreed upon basis.

After completion of the course work and before taking the comprehensive examination, the student, in consultation with his/her supervisor, will form a Supervisory Committee consisting of at least three, and normally no more than six, faculty members as follows:

- The supervisor, along with the co-supervisor if there is one.
- Two faculty members **with approved membership status in the Faculty of Graduate Studies,** ~~from Lakehead University~~ knowledgeable in the student's research area, no more than one of whom can be external to the Electrical and Computer Engineering Doctoral Supervisory list.
- In addition, at a later time but before the doctoral defence, one external member from outside Lakehead University will be added to the committee. This external member should have expertise in the area of research of the thesis and not be acquainted with the student. Selection of the external examiner will be made by

the Supervisor, in consultation with the Graduate Coordinator, **and approved by the Faculty of Graduate Studies**.

(c) ENGI 6701 Comprehensive Examination

The comprehensive examination experience serves two main purposes. First, it allows the Supervisory Committee to examine and approve the student's dissertation proposal. Second, it allows the Supervisory Committee to verify that the student has a broad knowledge of the general foundations of the chosen field.

The comprehensive examination should ~~be taken~~ **take place** after the completion of course work, **within** 8 to 12 months, and no later than 16 months, after the beginning of the doctoral program. **The Comprehensive Examination will be an oral examination conducted by the Supervisory Committee.** ~~It takes place in front of the Supervisory Committee.~~

To accomplish the first purpose **of the Comprehensive Examination,** the student must produce a dissertation proposal **that will be** submitted to each member of the Supervisory Committee at least one month prior to the examination. This proposal will present the proposed research project, a background review, and all research work done to date. At the beginning of the comprehensive examination, the student will make a 30-minute presentation of the proposal and this will be followed by a question period related to the proposal before the Supervisory Committee.

To accomplish the second purpose **of the Comprehensive Examination**, each Supervisory Committee member will ask questions related to the student's research area. The questions will be asked orally during the examination.

At the end of the Comprehensive Examination, the Supervisory Committee must decide whether the student passes the examination, fails the examination, or must be re-examined.

If the student fails the comprehensive examination, the student will be withdrawn from the Doctoral program. Students admitted to a Doctoral program without completion of a Master's program who fail the Comprehensive Examination will be permitted, at the discretion of the academic unit, to change their program to the Master's **degree** in Electrical and Computer Engineering.

(d) ENGI 6710 PhD Seminar

The PhD seminar experience serves two main purposes. First, it allows the candidate to describe his/her research progress. Second, it allows the candidate to become familiar with research done in other areas of Electrical and Computer Engineering.

The Seminar should be taken after the successful completion of the comprehensive exam, **within** 20 to 24 months, and no later than 28 months, after **initial registration in** ~~the beginning of~~ the doctoral program. ~~It~~ **The Seminar** is chaired by the Supervisor.

To accomplish the first purpose **of the PhD Seminar**, the candidate will prepare and make a 30-minute presentation on his/her research work, which will include a comprehensive background of the research area, the objectives of the research project, the latest progress since the comprehensive exam, and the planned work leading to the defence.

To accomplish the second purpose **of the PhD Seminar**, the candidate will attend the seminar presentations of other students in the PhD program in Electrical and Computer Engineering. Prior to registering for his/her own seminar, the candidate must have attended at least 6 seminars or acceptable alternatives.

(e) Dissertation and Oral Defence

The doctoral defence is the final evaluation of a doctoral candidate's work. ~~It~~ **The defence** must take place at most three years after the comprehensive examination. Please see the Faculty of Graduate Studies PhD regulations regarding the preparation of the dissertation and oral defence for general information.

The dissertation must be received and reviewed by the Supervisory Committee before the oral defence can take place. Based on their review of the dissertation, the Supervisory Committee will decide among the four possible outcomes:

- Dissertation Accepted.
- Dissertation Accepted with Minor Revisions.
- Dissertation Accepted with Major Revisions.
- Dissertation Rejected.

The dissertation must be either "accepted", "accepted with minor revisions" or "accepted with major revisions" before the student is allowed to proceed to the oral defence. **In cases where major revisions are required, the revisions must be completed and reviewed by the Supervisory Committee before the candidate advances to the oral defence.**

After the oral defence, the Supervisory Committee will decide among the four possible outcomes:

- Oral Defence Accepted.

- Oral Defence Accepted with Minor Revisions.
- Oral Defence Accepted with Major Revisions.
- Oral Defence Rejected.

(f) Period of Studies

The typical full-time student is expected to complete the doctoral program in 4 years (twelve terms). As shown in the following timeline, the first year (three terms) would be spent doing coursework and preparing for the comprehensive exam. The next two years (six terms) would be spent doing research and satisfying the other requirements. The final year (three terms) would be used to write the dissertation and prepare the defence.

Year 1 Fall: Initial registration, course work and background review
Year 1 Winter: Course work, background review, and selection of the committee
Year 1 Spring/Summer: Preliminary research work and thesis proposal redaction
Year 2 Fall: Comprehensive examination and research work
Year 2 Winter: Research work
Year 2 Spring/Summer: Research work and ~~research~~ **PhD** seminar
Year 3 Fall: Research work
Year 3 Winter: Research work
Year 3 Spring/Summer: Research work
Year 4 Fall: Dissertation writing
Year 4 Winter: Dissertation writing and defence
Year 4 Spring/Summer: Corrections to dissertation and final submission

(g) Residency Requirements

Doctoral candidates in this program are expected to be on campus at Lakehead University for the duration of their doctoral program. Exceptions are allowed if:

- The candidate needs to take a course that is offered at another university but not at Lakehead University and that cannot be taken through distance education. (Given the geographic distance between Lakehead University and other Ontario universities, it is accepted that the candidate will not reside at our campus during the ~~semester~~ **term in which** that course is taking place.)
- The research project requires using equipment or facilities not available at Lakehead University. (The candidate thus needs to work on-site at an off-campus location to do their research.)

PROGRAM

To fulfill the degree requirements, students must complete a total of eight (8) full course equivalents (FCE) at the graduate level consisting of the following components:
(a) Three half-credit graduate-level courses (worth 0.5 FCE each) (see: Academic Regulations (a) Course Requirements)
(b) PhD Seminar (ENGI 6710) (worth 0.5 FCE)
(c) Comprehensive Examination (ENGI 6701) (worth 1.0 FCE)
(d) ~~Thesis Proposal and Seminar~~ **PhD Dissertation** (ENGI 6901) (ENGI 9900) (worth 5.0 FCE)

DESCRIPTION OF NEW COURSES

ENGI 5732

Nonlinear Control

Credit weight: 0.5

Description: Students will learn about nonlinear models and nonlinear phenomena, Lyapunov stability, input-output stability, passivity, advanced stability analysis, stability of perturbed systems, feedback linearization, and nonlinear design tools.

Offering: 3-1.5**;** or 3-1.5

ENGI 5733

Robotics

Credit weight: 0.5

Description: Students will learn about D-H representation, forward kinematics, inverse kinematics, jacobian, Euler-Lagrange method, and Newton Euler method. This knowledge will be applied to the design of controls for robot manipulators.

Offering: 3-1.5 or 3-1.5

ENGI 5734

Natural Language Processing

Credit weight: 0.5

Description: Students will learn about the fundamentals of linguistics and of statistical inference in language, and how to apply statistical methods to basic tasks such as word sense disambiguation, part-of-speech tagging, and parsing. Students will explore recent work in advanced topics such as machine translation, information retrieval from text, and text categorization.

Offering: 3-1.5 or 3-1.5

ENGI 5735
Advances in Semiconductor Materials
Credit weight: 0.5
Description: Students will study advanced semiconductor materials based on compound alloys such as arsenides, phosphides, and nitrides. The properties of semiconductor materials - electrical and optical - will be determined on the basis of their electron band structures. Special attention will be given to calculation of the electron band structures on the ternary and quaternary semiconductor compound alloys and determination of the properties. New phenomena in the disordered alloys such as tunnel optical absorption and excitons of the structure will be studied.
Notes: Students who have successfully taken CHMS 5111 cannot register for this course.
Offering: 3-1.5 or 3-1.5

ENGI 5736
Nanostructured Materials
Credit weight: 0.5
Description: Students will study the properties of the nanostructures determined on the basis of their electron band structures, which will be calculated on the basis of Linear Combination of Atomic Orbitals (LCAO) method. Special attention will be given to calculation of the electron band structures of two-dimensional nanostructures and the related new phenomena connected with obtaining of relativistic particles in these structures.
Offering: 3-1.5 or 3-1.5

ENGI 6710
PhD Seminar
Credit weight: 0.5
Description: Students will gain experience in organizing and presenting the results of their scientific research to an audience of fellow scholars, and will become familiar with other scientific research in Electrical and Computer Engineering by attending the seminars of other students.
Notes: May only be taken by PhD students in Electrical and Computer Engineering. Must be taken no later than the seventh ~~semester~~ **term** of ~~their~~ **the** PhD program.
Grade Scheme: Pass/Fail
~~Offering: 1-0 or 1-0~~

ENGI 6701
PhD Comprehensive Examination
Credit weight: 1.0
Description: The comprehensive examination will assess the student's general preparedness for the PhD degree and specific areas in his or her chosen area of study and research. The exam will also assess the student's ability to integrate material from divergent areas, to reconcile theoretical, methodological and empirical issues, and to think critically and creatively.
Notes: May only be taken by PhD students in Electrical and Computer Engineering. Must be taken no later than the fourth semester of their PhD program.
Grade Scheme: Pass/Fail
~~Offering: 1-0 or 1-0~~

ENGI 6901 (9900)
PhD Dissertation
Credit weight: 5.0
Grade Scheme: Pass/Fail

MASTER OF PUBLIC HEALTH

Lakehead University offers a Master of Public Health degree ~~with the option of completing a Specialization in Nursing~~. Students will focus on current issues in the science and/or service of public health, so that they may gain experience through opportunities in any of the fundamental disciplines that underlie public health. The program is primarily intended to ~~prepare graduates for a career in public health practice.~~ build on the knowledge foundation of professionals currently working in the field of public health.

The program's objectives are to prepare a graduate who: possesses advanced health-related education; is capable of critical analysis; understands health-related decision-making at the level of the individual, population, and government; understands research; and possesses knowledge exchange and dissemination strategies for individuals, populations, and government.

Within the Master of Public Health program, students have the option of completing the regular Master of Public Health program, a Specialization in Nursing, or ~~Gerontology~~ a Specialization in Gerontology~~,~~. Within the Master of Public Health Specialization in Nursing, successful applicants can ~~opt to take~~apply to the Master of Public Health Specialization in Nursing with Primary Health Care Nurse Practitioner Electives.

~~The degree is designed to take into consideration the learner's needs including the unique opportunity to individualize his/her clinical courses to a variety of foci: clinical practice, administration, education and community health.~~

ADMISSION REQUIREMENTS

Candidates will be ~~accepted~~ considered for admission under the Faculty of Graduate Studies Master's Regulations provided they also satisfy additional requirements, if applicable, as listed below.

The application deadline is **February 1**. Late applications may be considered for admission, but may not be considered for funding.

In addition, applicants must submit a curriculum vitae and a statement of goals and intentions for the course of study. An interview may also be required. Admission decisions will be made by the Department of Health Sciences~~interdisciplinary MPH~~ Admissions Committee ~~in the Department of Health Sciences~~. Preference will be given to applicants who have completed statistics and research methods courses.

~~Additional admission requirements for the MPH Specialization in Nursing:~~
~~1. Four-year Bachelor of Science in Nursing degree or its equivalent from a university of recognized standing with a minimum "B" average.~~
~~2. Evidence of a commitment to nursing as contained in the student's résumé and Statement of Goals and Intentions.~~
~~3. Proof of current registration or eligibility to register with the College of Nurses of Ontario or another jurisdiction in Canada.~~
~~4. Current Immunization status.~~
~~5. Basic Life Support Certificate current.~~

The Master of Public Health can be taken through either a ~~Thesis~~ Course Option or a ~~Course~~Thesis Option, indicated by students at the time of application.~~,~~. ~~Students wishing to complete a thesis must, at the time of application, identify a potential supervisor from among the core faculty in the MPH program, **prior** to applying to the program. The name of the faculty member who will supervise the thesis must be identified in the statement of goals. Early in their program, after consulting with their faculty supervisor, s~~Students who wish to apply to switch program options ~~who prefer the Thesis Option~~ may request a program change ~~with the permission of their Graduate Co-ordinator~~ which will be reviewed by the Department; the Department's decision is final and binding. The request for a program change must be made by December 31st of the first year of study for full-time students, and

by April 30th of the first year of study for flexible full-time students; program change requests made after this time will not be considered~~. The thesis option is not available to MPH students in the Specialization in Nursing within the program requirements~~. Normally, students will not be granted more than one program change during their period of study.

Students applying to the Thesis Option must identify their research interests in their statement of goals and intentions; these should be in line with the areas of expertise within the full-time Faculty of the Department of Health Sciences. Students admitted to the Thesis Option will have a supervisor assigned by the Department during the first term of the program.

Master of Public Health students may apply to the Specialization in Nursing. The additional admission requirements for the Master of Public Health Specialization in Nursing include:

1. Four-year Bachelor of Science in Nursing degree or its equivalent from a university of recognized standing with a minimum "B" average.
2. Evidence of a commitment to nursing as contained in the student's résumé and Statement of Goals and Intentions.
3. Proof of current registration or eligibility to register with the College of Nurses of Ontario or another jurisdiction in Canada.
4. Current Immunization status.
5. Basic Life Support Certificate current.

~~Master of Public Health students in the Nursing Specialization may apply to the Thesis Option; however, the thesis will involve extra coursework in addition to the Master of Public Health program requirements (i.e., an additional full course equivalent, or 1 FCE).~~

~~M~~aster of Public Health students may apply to the Nursing Specialization with Nurse Practitioner Electives, offered in conjunction with the School of Nursing.

Master of Public Health students may apply to the Collaborative Graduate Program with Specialization in Gerontology. Students wishing to complete thi~~s~~e specialization must note their interest in Gerontology in their application to the Master of Public Health Course Option, or identify their research interests in Gerontology in their application to the Master of Public Health Thesis Option~~a faculty member who is willing to supervise the work in the field of gerontology **prior** to applying to the program~~. Note that in the Master of Public Health ~~MPH students in the~~ Thesis Option~~, may be admitted to the Collaborative Graduate Program with Specialization in Gerontology; however,~~ the Gerontology courses will need to be taken as extra courses in addition to the ~~MPH~~ Master of Public Health program requirements (i.e., an additional half course equivalent, or 0.5 FCE).

~~Master of Public Health students may apply to the Graduate Diploma in Health Services and Policy Research offered by Lakehead University, as part of the Ontario Training Centre in Health Services and Policy Research.~~

ACADEMIC REGULATIONS

In addition to Faculty of Graduate Studies Master's Regulations, the following regulations apply to students in the MPH program.

Registration

Students in the Master of Public Health program will normally complete a maximum of three half-credit courses (1.5 FCEs) per term (fall, winter, spring/summer). A student who wishes to take more than three half-credit courses in a single term may do so only if the student has:
(1) at least an 80% overall average in the previous term, and
(2) the permission of ~~the~~ a Master of Public Health Graduate Co-ordinator.
Students are not eligible to take more than three half-credit courses in their first term of study.

Thesis Process

Each student in the Thesis Option will have a thesis committee which is approved by ~~the~~ a ~~MPH~~ Master of Public Health Graduate Co-ordinator. The Master of Public Health Graduate Co-ordinator will authorize the Thesis Option student to seek ethical approval after successfully defending the thesis proposal. Prior to submission of the final thesis grade, the Master of Public Health Graduate Co-ordinator will ensure that all recommendations made at the time of the thesis defence and by the external examiner, have been addressed.

Letter of Agreement

When any portion of a student's thesis~~/research project~~ work is to be carried out at his/her employer's premises, prior to proposing the thesis~~/research project~~ topic, a letter of agreement from his/her employer to his/her supervisory committee must be filed by the student with the ~~Office~~ Faculty of Graduate Studies. The letter must indicate, clearly, the scope and limits of the permission granted by the student's employer to carry out the work at the employer's premises. The letter must also give details of time slots that the employer may provide the student to carry out his/her thesis~~/research project~~ work at the employer's premises. The issue of liability insurance must also be addressed in the letter of agreement.

Practicum Placement

Practicum placements normally take place after completion of the required courses (PUBL 5010, 5030, 5070, 5210, 5211, 5212, 5213) and electives, and after all course grades appear on the transcript. It is the responsibility of the student to contact the ~~MPH~~ Department of Health Sciences Administrative Co-ordinator at least 6 months prior to proceeding with the practicum placement, in order to ensure adequate time to plan the practicum.

The graduate student must maintain at least a 70% average to proceed with the practicum placement. Any course that must be repeated, must be ~~repeated~~ successfully completed before the student can proceed with the practicum placement.

The Department of Health Sciences Administrative Co-ordinator will arrange one practicum placement for each student. If the student's actions jeopardize the placement that has been arranged, the student will be required to either secure his/her own appropriate practicum placement, subject to the approval of the Department, or withdraw from the program.

Safe Clinical Practice

A student may be excluded from the clinical area when his/her performance is deemed to be unsafe. Unsafe practice is any situation arising from a student's interaction with a client which places the client and/or student at risk for harm (refer also to the School of Nursing Safety Policy Statement).

Reference Check

Students in Health and Behavioural Sciences should be aware that criminal reference checks may be required and that unsafe practice and unsuitable professional behaviour can result in dismissal from the program.

Minimum Satisfactory Academic Standing

1. General

As an exception to the Faculty of Graduate Studies Master's Regulations, no more than one half-course (0.5 FCEs) in ~~an~~ ~~MPH~~ the Master of Public Health program may be repeated.

A graduate student who receives an "F" in ~~the~~ Public Health 5805 – Master of Public Health~~MPH Pp~~racticum and Report will not be permitted to repeat the practicum or continue in the program.

2. Primary Health Care Nurse Practitioner Courses

As an exception to the Faculty of Graduate Studies Master's Regulations on minimal acceptable academic standing, graduate students must achieve 70% or higher in the following half-courses: Public Health 5610, 5615, 5616, 5630, 5635 and 5636. A student must also achieve 70% in the full course Public Health 5840. A score of less than 70% in these courses will constitute a failure.

A failed half-course may be repeated or replaced by another course specified by the supervisor only

once. Any student taking the following half-courses with more than one half-course failure on his/her record must withdraw from the program: Public Health 5610, 5615, 5630, 5635 and 5636. A student failing Public Health 5840 must withdraw from the program.

Period of Study
Students in a Master's program are expected to complete all requirements within six terms (2 years) of continuous full-time registration. As an exception, students in the ~~MPH~~ Master of Public Health programs can be admitted to the Flex Option of six additional terms of continuous registration. As this option is intended for working professionals, students admitted to the Flex Option will not ~~normally~~ be considered for financial support. *Note that students will not be permitted to change from the Standard Option to the Flex Option, and vice versa.*

Primary Health Care Nurse Practitioner Courses for Students in Master of Public Health~~MPH~~ with Nursing Specialization
Students admitted to this Specialization may apply to the Master of Public Health~~MPH~~ Nursing Specialization Graduate Co-ordinator for permission to take courses leading to certification as a Nurse Practitioner. Those students must complete a total of 7 FCEs that include the following required courses: Public Health 5010, 5030, 5070, 5211, 5212, 5213; and the following elective courses: Public Health 5610, 5615, 5616, 5630, 5635, 5636 and 5840.

As an exception to the Faculty of Graduate Studies Master's Regulations regarding Advanced Standing, applicants to the Master of Public Health~~MPH~~ Nursing Specialization with Primary Health Care Nurse Practitioner Electives who hold a current RN (EC) licence or equivalent and have completed the following graduate level courses or their equivalent with a minimum grade of 70% within the past 5 years from a COUPN Consortium program: Nursing 5610, 5630, 5615, 5616, 5635, 5636 and 5840; will have the following Master of Public Health courses waived: PUBL 5610, 5630, 5615, 5616, 5635, 5636 and 5840 and will be required to successfully complete PUBL 5010, 5030, 5070, 5211, 5212 and 5213 only.

PROGRAMS

The Master of Public Health can be taken through either a Course Option or a Thesis Option~~. Students wishing to complete a thesis must identify a faculty member who is willing to supervise their work **prior** to applying to the program. The name of the faculty member who will supervise the thesis must be identified in the statement of goals. Early in their program, after consulting with their faculty supervisor, students in the Course Option who prefer the Thesis Option may request a program change with the permission of their Graduate Co-ordinator. The thesis option is not available to MPH students in the Specialization in Nursing within the program requirements~~.

1. MASTER OF PUBLIC HEALTH

A. Course Option:

Students must complete a total of 7 FCEs, including a 400-hour practicum. ~~Required c~~Courses ~~include~~are Course requirements include:

(a) Required Courses~~:~~

Public Health 5010 - Foundations of Public and Population Health
Public Health 5030 - Research Methods, Design and Analysis
Public Health 5070 - Epidemiology I
Public Health 5210 - Health Promotion and Illness Prevention
Public Health 5211 - Public Health Ethics
Public Health 5212 - Canadian Health Care System
Public Health 5213 - Environmental and Occupational Public Health

(b) Electives

Four half-courses (2 FCEs) electives at the graduate level selected in consultation with the Graduate Co-ordinator.

(c) Practicum

Public Health 5805 (9805) - Master of Public Health~~MPH~~ Practicum and ~~Project~~ Report (1.5 FCEs)

~~Four half-courses (2 FCEs) electives at the graduate level selected in consultation with academic advisor~~the Graduate Co-ordinator~~.~~

B. Thesis Option:

Students must complete a total of 7 FCEs, including a 400-hour practicum and a thesis. ~~C~~~~Required courses include~~are Course requirements include:

(a) Required Courses

Public Health 5010 - Foundations of Public and Population Health
Public Health 5030 - Research Methods, Design and Analysis
Public Health 5070 - Epidemiology I
Public Health 5210 - Health Promotion and Illness Prevention
Public Health 5211 - Public Health Ethics
Public Health 5212 - Canadian Health Care System
Public Health 5213 - Environmental and Occupational Public Health

(b) Practicum

Public Health 5805 (9805) - Master of Public Health~~MPH~~ Practicum and Report (1.5 FCEs)

(c) Thesis

Public Health 5901 (9901) - Master's Thesis (2 FCEs)

2. MASTER OF PUBLIC HEALTH - SPECIALIZATION IN NURSING

A. Course Option:

Students ~~in the MPH with Specialization in Nursing~~ must complete a total of 7 FCEs, including a 400-hour practicum placement in the area of nursing.~~will complete the following core courses and the requirements of either the Course Option or the Course Option with Nurse Practitioner Electives. The thesis option is not available to MPH students in the specialization in Nursing.~~ ~~Required courses~~

~~are~~Course requirements include:

(a) Required Courses

~~**Core Courses:**~~

Public Health 5010 - Foundations of Public and Population Health
Public Health 5030 - Research Methods, Design and Analysis
Public Health 5070 - Epidemiology I
Public Health 5211 - Public Health Ethics
Public Health 5212 - Canadian Health Care System
Public Health 5213 - Environmental and Occupational Public Health

(b) Course Option Electives

Public Health 5210 - Health Promotion and Illness Prevention
~~Public Health 5211 – Public Health Ethics~~
~~Public Health 5212 – Canadian Health Care System~~
~~Public Health 5213 – Environmental and Occupational Public Health~~
Public Health 5332 - Nursing Theory in Public Health
Public Health 5337 - Nursing Leadership

(c) Open Electives

Two half-courses (total 1.0 FCE) electives at the graduate level selected in consultation with the Graduate Co-ordinator

(d) Practicum

Public Health 5805 (9805) – Master of Public Health Practicum and Report (1.5 FCEs)

~~**A. Course Option:**~~

~~Students must complete a total of 7 FCEs, including a 400-hour practicum. In addition to the six half-courses listed above, students must also complete:~~
~~Public Health 5210 – Health Promotion and Illness Prevention~~
~~Public Health 5332 – Nursing Theory in Public Health~~
~~Public Health 5337 – Nursing Leadership~~
~~Public Health 5805 (9805) – MPH Practicum and Report (1.5 FCEs)~~
~~Two half-courses (total 1.0 FCE) electives at the graduate level chosen~~ selected ~~in consultation with academic advisor supervisor~~the Graduate Co-ordinator~~.~~

B. Course Option with Nurse Practitioner Electives:

Students must complete a total of 7 FCEs. ~~They must complete all required Master of Public Health courses, with the exception of PUBL 5210 – Health Promotion and Illness Prevention and Public Health 5805 – Master of Public Health~~MPH Practicum and Report. ~~In addition to the six half-courses listed above, s~~Students must also complete Course requirements include:~~:~~

(a) Required Courses

Public Health 5010 – Foundations of Public and Population Health
Public Health 5030 – Research Methods, Design and Analysis
Public Health 5070 – Epidemiology I
Public Health 5211 – Public Health Ethics
Public Health 5212 – Canadian Health Care Systems
Public Health 5213 – Environmental and Occupational Public Health

(b) Nurse Practitioner Electives

Public Health 5610 - Pathophysiology for the Nurse Practitioner
Public Health 5615 - Advanced Health Assessment and Diagnosis I
Public Health 5616 - Advanced Health Assessment and Diagnosis II
Public Health 5630 - Nurse Practitioner Roles and Responsibilities
Public Health 5635 - Therapeutics I
Public Health 5636 - Therapeutics II

(c) Practicum

Public Health 5840 (9840) - Nurse Practitioner Integrative Practicum (1.0 FCE)

~~**C. Thesis Option:**~~

~~Students must complete a total of 87 FCEs, including a 400-hour practicum placement in the area of nursing and a thesis. In addition to the required Master of Public Health Nursing Specialization courses, they will do their thesis in lieu of elective courses. *Partial fulfillment of the Thesis Option will need to be taken as extra coursework in addition to the Master of Public Health*~~*MPH program*

~~*requirements (i.e., representing an addition full course equivalent, or 1.0 FCE).*~~~~Course requirements include:~~
~~(a) Required Courses~~
~~Public Health 5010 – Foundations of Public and Population Health~~
~~Public Health 5030 – Research Methods, Design and Analysis~~
~~Public Health 5070 – Epidemiology I~~
~~Public Health 5210 – Health Promotion and Illness Prevention~~
~~Public Health 5211 – Public Health Ethics~~
~~Public Health 5212 – Canadian Health Care Systems~~
~~Public Health 5213 – Environmental and Occupational Public Health~~
~~Public Health 5332 – Nursing Theory in Public Health~~
~~Public Health 5337 – Nursing Leadership~~
~~(b) Practicum~~
~~Public Health 5805 (9805) – Master of Public Health Practicum and Report (1.5 FCE)~~
~~(c) Thesis~~
~~Public Health 5901 (9901) – Master's Thesis (2 FCE)~~

~~The Thesis Option is not available to students in the Specialization in Nursing with Nurse Practitioner electives.~~

3. COLLABORATIVE GRADUATE PROGRAM WITH SPECIALIZATION IN GERONTOLOGY

Students in the MPH program may apply for acceptance into the Collaborative Program with Specialization in Gerontology. They will take Gerontology 5710 - Research and Theory in Gerontology (half-course equivalent) in place of a~~n~~ Master of Public Health~~MPH~~ elective; they will participate in Gerontology 5790 - Gerontology Research Seminar (non-credit), and they will do their practicum placement and project in the area of gerontology. See the Specialization in Gerontology for details. *Master of Public Health~~MPH~~ students in the Thesis Option may be admitted to the Collaborative Graduate Program with Specialization in Gerontology; however, the Gerontology courses will need to be taken as extra courses in addition to the Master of Public Health~~MPH~~ program requirements.*

~~**4. MPH WITH GRADUATE DIPLOMA IN HEALTH SERVICES AND POLICY RESEARCH**~~

~~MPH students who wish to obtain a Graduate Diploma in Health Services and Policy Research should refer to the Faculty of Health and Behavioural Studies Graduate Programs, Graduate Diploma in Health Services and Policy Research. The Health Services and Policy Research courses will need to be taken as extra courses in addition to the Master of Public Health MPH program requirements.~~