

Request for Calendar Change Form

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

To Secretary of Senate
From Name(Dean): Faculty
A. Dean SES
Department the change relates to
Chemistry
Contact Person
C. Gottardo

Is the proposed calendar change Graduate

Instructions:

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

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

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

Section 1

Description of the Proposed Calendar Change:

The proposed calendar change is the introduction of a new Doctor of Philosophy in chemistry and materials science

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

1

The PhD program has now obtained approval from OCGS and herein we present the calendar entry.

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

1

There is no existing entry

PHD (Chemistry and Materials Science)

Program Coordinator:
G. Spivak

Core: Doctoral Supervisory
D. Alexandrov (Electrical Engineering)
L. Catalan (Chemical Engineering and Canada Research Chair)
A. Chen (Chemistry and Canada Research Chair)
G. Das (Physics)
W. Floriano (Chemistry and SHARCNET Chair)
M. Gallagher (Physics)
W. Gao (Civil Engineering)
C. Gottardo (Chemistry)
Z-H. Jiang (Chemistry)
S.D. Kinrade (Chemistry)
D. Law (Biology)
B. Liao (Chemical Engineering)
A. Linhananta (Physics)
C.D. MacKinnon (Chemistry)
R. Mawhinney (Chemistry)
M. Rappon (Chemistry)
C. Xu (Chemical Engineering)

Adjunct Professors:
D. Yang (Chemistry)

Doctor of Philosophy in Chemistry and Materials Science (PhD)
The PhD in Chemistry and Materials Science is a research-intensive graduate program focused on the intellectual development and advanced training of scientists in two fields of specialization – Physical Chemistry, the study of physical principles which govern the behaviour and properties of chemical systems; and Molecular and Materials Science, the synthesis and characterization of novel compounds and materials.

Admission Requirements:
Admission will be subject to the availability of a primary supervisor(s) for the student.
Normally, an applicant to the Program would be

expected to have completed a Master's Degree in one of the fields of specialization. Applicants who do not have such a degree will be considered on a case-by-case basis and, if admitted, will have additional course requirements.

Academic Regulations:

In addition to the Faculty of Graduate Studies Regulations governing doctoral (PhD) programs, the following regulations apply to students in the PhD in Chemistry and Materials Science program.

1. Program Coordinating Committee

A Chemistry and Materials Science PhD Program Coordinating Committee, chaired by the Program Coordinator, provides overall direction for the Program.

2. Supervisory Committee

The Supervisory Committee will consist of at least three members, of whom two are core faculty including the student's Principal Supervisor (Committee Chair), and Co-supervisor (if any). The Supervisory Committee will be chosen by the Program Coordinator in consultation with the Principal Supervisor and the student. Membership on the Committee may be altered to reflect changes in expertise/requirements, in consultation with the Program Coordinator. The Committee will meet with the student at least once every six months, and the student will submit a written summary of progress to the Committee at least once a year. The Committee Chair will provide a written report of the meeting to the Program Coordinator and the student, who may follow-up with a written response to the committee. An unsatisfactory performance in three consecutive committee meetings shall be grounds for dismissal from the program. The Supervisor in consultation with the student will normally be responsible for convening the meetings.

The academic program of each PhD candidate will be tailored by the Supervisory Committee in consultation with the student, and recommended to the Program Coordinating Committee for approval.

3. Residency

The full-time residency requirement at Lakehead University will be a minimum of one year (three terms), of which two terms must be consecutive.

4. Qualifying Examination

A Qualifying Examination will be held within 12

months of initial registration in the program to assess the student's general preparedness for the PhD degree in his or her chosen area of study. It will also assess the student's ability to integrate material from divergent areas, to reconcile theoretical, methodological and empirical issues, and to think creatively. The examination will be conducted orally by a Qualifying Examination Committee that is selected by the Supervisory Committee. There may also be a written component, if so recommended by the Supervisory Committee.

Only two attempts at the examination will be permitted. Students who fail the second attempt will be required to withdraw from the PhD Program.

5. Dissertation and Defence

The dissertation research must be original and significantly advance knowledge in chemistry or materials science. The dissertation will be published in a standard thesis format, for example, consisting of a literature survey, a materials and methods section, experimental results with corresponding narrative, a discussion of the findings in the context of previous knowledge, and a comprehensive bibliography. The thesis will be reviewed by the Examination Committee, consisting of members of the Supervisory Committee and an examiner who is external to Lakehead University and has expertise in the student's area of research.

The student must successfully defend the dissertation in a public oral presentation and an in-camera exam before the Examination Committee. If the External Examiner cannot come to the defence in person, he/she may participate by video conferencing or by proxy (represented by the student's Examination Committee).

6. Period of Study

Students will be expected to complete their course requirements, candidacy exam, dissertation and defence within a maximum of 4 years from entry into the PhD Program.

Program:

To fulfill the degree requirements, students must complete a total of seven (7) full course equivalents at the graduate level consisting of the following components:

- (a) Qualifying Examination (Chemistry and

- Materials Science 6010) (a non-credit required course)
- (b) PhD Seminar (Chemistry and Materials Science 6600 and 6601 (two non-credit required courses)
- (c) two half-course electives at the graduate level
- (d) PhD Dissertation 6901 (9901) (worth 6 FCEs)
- (e) Thesis Proposal and Seminar (a non-credit required course)

The half-course electives may be drawn from 5000-level courses offered within the Department of Chemistry and other cognate departments as recommended by the Supervisory Committee.

Graduate Courses:

CHMS 5111

Advances in Semiconductor Materials

(0.5 FCE)

3-0 or 3-0

An introduction to advanced semiconductor materials based on compound alloys such as arsenides, phosphides, and nitrides. Their properties - 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.

CHMS 5311

Materials Characterization

(0.5 FCE)

1.5-1.5; 1.5-1.5

A cross-disciplinary course in instrumental analysis and research methodology. Students choose three modules from a series of offerings that can include scanning electron microscopy, nuclear magnetic resonance spectroscopy, x-ray diffraction spectroscopy, infrared spectroscopy, mass spectroscopy, optical microscopy, paper testing, chromatography, and DNA sequencing.

CHMS 5511

Surface Science

(0.5 FCE)

3-0 or 3-0

The chemistry and physics of solid surfaces. Emphasis on fundamental aspects of the following areas of surface science: surface crystallography and reconstruction; kinetics of gas-solid

interactions; adsorption; heterogeneous catalysis; oxidation and corrosion; and nucleation and growth of thin films by physical and chemical vapour deposition.

CHMS 5711

Nanostructured Materials

(0.5 FCE)

3-0 or 3-0

This course will explore the preparation, characterization and applications of nanostructured materials from a chemical perspective.

CHMS 6010: Qualifying Examination

The qualifying examination will assess the student's general preparedness to continue in the PhD degree and specific field in his or her chosen area of study.

CHMS 6050 Thesis Proposal and Seminar

Students will be required to research and write a proposal for the work they plan to pursue for their thesis topic. As part of their participation in this course students will present a seminar on this literature review and proposal. Students must also attend seminars presented by Chemistry and Materials Science invited speakers. This non-credit course must be taken within the first three semesters of the student's entry into the PhD program.

CHMS 6510 - Special Topics in Materials Science

(0.5 FCE)

3-0 or 3-0

Recent developments in materials science will be presented.

CHMS 6530 - Special Topics in Physical Chemistry

(0.5 FCE)

3-0 or 3-0

Topics may be chosen from: electrochemistry, kinetics, surface and colloid chemistry; electrical and optical aspects of molecular behaviour.

CHMS 6600 - PhD Seminar First Year

A compulsory seminar course for all PhD students in their first year of study. Students will be required to present one seminar and attendance for all seminars will be mandatory. It is anticipated that this required course provides a common experience for all of the students enrolled in the program and will introduce the student to a variety of research topics.

CHMS 6601 - PhD Seminar Second Year
A compulsory seminar course for all PhD students in their second year of study. Students will be required to present one seminar and attendance for all seminars will be mandatory. It is anticipated that this required course provides a common experience for all of the students enrolled in the program and will introduce the student to a variety of research topics.

CHMS 6901(9901): PhD Dissertation (6 FCE)

Section 3

The Faculty(ies) affected by the proposed calendar change

SES

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

Name:

A. Dean

Faculty:

SES

Date:

Signature of Dean