Graduate Calendar
Winter 2027

FOREWORD

The Graduate Calendar is a comprehensive guide to all graduate programs and courses available at the University of Windsor. It outlines academic regulations and standards, program degree requirements, and general University policies.

The online calendars are the official calendars. The University of Windsor publishes Graduate web calendars on a semester basis (Fall, Winter, and Spring).

Note: Students may follow the academic rules and program regulations set out in the calendar of the term in which they were first admitted to the program or any subsequent calendar.

FEDERATED AND AFFILIATED INSTITUTIONS

Assumption University
Canterbury College
Iona College

The University of Windsor is a full member of the Association of Universities and Colleges of Canada, and the International Association of Universities.

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RESPONSIBILITY/DISCLOSURE NOTIFICATIONS

STATEMENT OF RESPONSIBILITY OF THE UNIVERSITY

1. The content of this Calendar is provided for the general guidance of the student and is not intended to make any contractual commitments therefor. The Calendar is accurate at the time of publication, but programs, courses, staffing, etc. are subject to change from time to time as deemed appropriate by the University of Windsor in order to fulfill its role and mission, or to accommodate circumstances beyond its control. Any such changes may be implemented without prior notice and, unless specified otherwise, are effective when made. The official University of Windsor academic calendars are: the Undergraduate Web Calendar, the Graduate Web Calendar, and the Faculty of Law Calendar.

2. This Calendar represents the University of Windsor's best judgment and projection of the course of conduct of the University of Windsor during the periods addressed herein. It is subject to change due to forces beyond the University of Windsor's control or as deemed necessary by the University of Windsor in order to fulfill its educational objectives.

3. Advisors are provided to assist students in planning their academic programs. Advisors are not authorized to change established policy of the University of Windsor. Students are solely responsible for assuring that their academic programs comply with the policies of the University of Windsor. Any advice which is at variance with established policy must be confirmed by the appropriate Dean's Office.

4. Any tuition fees and/or other charges described herein are good faith projections for the academic year. They are, however, subject to change from one academic term to the next as deemed necessary by the University of Windsor in order to meet its financial commitments and to fulfill its role and mission.

5. There are other fees and charges which are attendant upon a student's matriculation at the University of Windsor. These fees or charges may be determined by contacting the University offices which administer the programs or activities in which the student intends to enroll or engage.

6. The University of Windsor reserves the right to terminate or modify program requirements, content, and the sequence of program offerings from term to term for educational reasons which it deems sufficient to warrant such actions. Further, the University of Windsor reserves the right to terminate programs from term to term for financial or other reasons which it determines warrant such action. The content, schedule, requirements and means of presentation of courses may be changed at any time by the University of Windsor for educational reasons which it determines are sufficient to warrant such action. Programs, services, or other activities of the University of Windsor may be terminated at any time due to reasons beyond the control of the University of Windsor.

7. The course descriptions herein are based upon reasonable projections of faculty and faculty availability and appropriate curriculum considerations. The matters described are subject to change

based upon changes in circumstances upon which these projections were based and as deemed necessary by the University of Windsor to fulfill its role and mission.

NOTIFICATION OF DISCLOSURE OF PERSONAL INFORMATION TO STATISTICS CANADA

Statistics Canada is the national statistical agency. As such, Statistics Canada carries out hundreds of surveys each year on a wide range of matters, including education.

It is essential to be able to follow students across time and institutions to understand, for example, the factors affecting enrollment demand at post-secondary institutions. The increased emphasis on accountability for public investment means that it is also important to understand outcomes. In order to carry out such studies, Statistics Canada asks all colleges and universities to provide data on students and graduates. Institutions collect and provide to Statistics Canada student identification information (student's name, student ID number, Social Insurance Number), student contact information (address and telephone number), student demographic characteristics, enrollment information, previous education, and labour force activity.

The Federal Statistics Act provides the legal authority for Statistics Canada to obtain access to personal information held by educational institutions. The information may be used only for statistical purposes, and the confidentiality provisions of the Statistics Act prevent the information from being released in any way that would identify a student.

Students who do not wish to have their information used are able to ask Statistics Canada to remove their identification and contact information from the national database.

Further information on the use of this information can be obtained from Statistics' Canada's web site: http://www.statcan.ca or by writing to the Postsecondary Section, Centre for Education Statistics, 17th Floor, R.H. Coats Building, Tunney's Pasture, Ottawa, K1A 0T6.

PROGRAM AND COURSE LEARNING OUTCOMES

Program and Course Learning Outcomes can be found online in the Curriculum Mapping and Design (CuMa) database, which is an online tool that contains an archive of the official program and course learning outcomes at the University of Windsor

Programs https://ctl2.uwindsor.ca/cuma/public/programs/
Courses: https://ctl2.uwindsor.ca/cuma/public/courses/

ACADEMIC REGULATIONS

FACULTY REGULATIONS FOR THE DOCTOR OF PHILOSOPHY

Admission Requirements for the Doctor of Philosophy (PhD)
Graduates of recognized universities may apply for admission. In general, admission to graduate study is granted only to those students who have good academic records and who are adequately prepared to undertake graduate work in their field of specialization. In particular, an applicant for admission to a graduate program leading to the degree of Doctor of Philosophy must have either a Master's degree or, in exceptional cases, a four-year Bachelor's degree, or the equivalent; with a minimum average of 77% (or equivalent). Possession of the minimum requirements does not ensure admission.

Fast Track Admission to the Degree of Doctor of Philosophy (PhD)
This process allows a student to enter the PhD program without first completing the Master's degree. Recommendations from the program must be made no earlier than Term 3, and be approved prior to the completion of Term 4 of the Master's degree. Recommendations received beyond the end of Term 4 will not be considered. To be eligible, the student must have completed all graduate courses for the Master's degree and must have obtained a minimum 80% average. The supervisory committee must recommend the transfer, in writing, based on demonstrated excellence in research and provide evidence of a complete plan of research for the doctoral degree. All applications must be approved by the Faculty of Graduate Studies.

Following admission to the PhD, the student must complete additional courses beyond those required for the Master's degree as outlined in their program requirements.

Program Requirements for the Degree of Doctor of Philosophy

Residence
Residence requirements are intended to provide for each student an adequate contact with the University, with the faculty in the field of specialization, and with the library, laboratories, and other facilities for graduate study and research. Every student in a program leading to the degree of Doctor of Philosophy must be registered in a full-time program of study for a minimum of three calendar years, normally in succession. Credit for one of these years may be given for the time spent in proceeding to a Master's degree.

Transfer credits will only be granted at the time of admission, and recommendations must be included with the offer of admission. Normally, credits must have been received in the last 5 years with a minimum grade of 70%, and no credits used towards a previously completed certificate, diploma, or degree or used as a basis of admission will be approved as credit toward a Windsor graduate degree. A maximum of 50% of the Windsor course degree requirements will be approved for transfer credit, excluding internship/practicum, thesis, dissertation, or comprehensive examination courses.

If transfer credit is granted, the student may be required to take alternate course(s) as recommended by the program. Approved transfer credit will appear on the student's transcript.

A full-time residence year indicates that a student is in full-time work under the direction of a faculty member at the University of Windsor.

Candidacy

Admission to graduate study does not imply admission to candidacy for a degree. Admission to candidacy for the degree of Doctor of Philosophy is granted by the Dean of Graduate Studies, upon recommendation of the program concerned, when a student has satisfied the requirements for candidacy of the Faculty of Graduate Studies and of the program, as may be specified in program listings in the calendar. Admission to candidacy is normally to be regarded as recognition that a student has given adequate evidence of superior capability and achievement in graduate study. A student may not be admitted to candidacy for the degree of Doctor of Philosophy before passing a comprehensive examination in the field of specialization.

Time Limit
A student admitted to a PhD program must complete all requirements for the PhD. within six consecutive years.

If an extension of the time limit becomes necessary, the student should address a petition to the Dean of Graduate Studies giving reasons for the request and plans for the completion of the work. A student who exceeds the time limit may be required to take additional qualifying examinations or additional course work, or both.

Course of Study
Course requirements are specified in the program listings. Planning and direction of the student's course of study are the responsibility of the program coordinator or a designated departmental advisor. A specific program of study should be worked out at the time of the student's first registration, in consultation with the program.

Since in several programs only a few courses listed will be offered each year, students are advised to ascertain from the program area which courses will be offered in any given year.

In consultation with their program area, all students must complete an Annual Report, which is to be submitted to their department by May 31 of each year.

It is expected that students working toward the degree of Doctor of Philosophy will maintain a superior average in all course work. Normally, graduate credit will be given only for courses in which a minimum 70% grade has been achieved. See also Senate Policy on Grading and Calculation of Averages.

Declaration of Conflict of Interest (COI) in Supervision
A Conflict of Interest (COI) exists if a supervisor, co-supervisor, and/or committee member has a financial or close personal relationship (e.g., romantic, sexual, marital, or familial) with a student over whom they have a supervisory or evaluative role.

Should such a relationship between a supervisor and student develop, the supervisory relationship will be terminated, and the Graduate Program Chair may act as supervisor for the student until a new supervisor can be determined. The former supervisor, co-supervisor and/or the academic unit may remain responsible for the maintenance of any existing or promised financial support until appropriate supervision can be found in consultation with the Dean of Graduate Studies or their designate.

Likewise, a COI exists if supervisors, co-supervisors, and committee members have a financial or close personal relationship (e.g., romantic, sexual, marital or familial) with one another. Should such a relationship develop or be identified, the program may take one of the following options to mitigate the COI:

1. One or more of the individuals involved may resign from the committee so that only one person involved in the relationship remains a member of the committee, or; 2. An additional committee member will be added.

In the case that a Graduate Program Chair is also a student's supervisor, another Graduate Committee Chair (e.g., Department Head) may be named for that student throughout the supervisor's tenure in that role.

Committees

Research undertaken as part of a doctoral program is normally directed by a faculty supervisor and advised by a doctoral committee.

By the end of the first term of registration in the dissertation, the program will recommend the appointment of members of the doctoral committee, whose appointments must be approved by the Faculty of Graduate Studies. At the same time the candidate will be required to validate the Non-Exclusive License to the University of Windsor authorizing the University to archive, reproduce, and distribute the dissertation.

The doctoral committee will include as a minimum a research supervisor or co-supervisors from the program, who is(are) a member of graduate faculty, two other program readers, and one outside program reader from the University of Windsor who does not hold supervisory privileges in the student's program. The outside program reader ensures quality of the written work, can provide an objective perspective and feedback on the research and writing process, in addition to introducing the student to new ideas that may enhance the impact of the dissertation on the scholarly community. This role fosters interdisciplinary collaboration and contributes to situating the work within a larger societal context. Additional members may be added with the approval of the program and the Faculty of Graduate Studies. This committee will, from time to time, review the student's progress.

The majority of committee members must have full graduate faculty status, including the Supervisor and one program reader. If there are co-supervisors one of the two must be from the program and hold full graduate faculty status. The other must hold either affiliate or full graduate faculty status. See Senate Policy on Graduate Faculty Designation.

The doctoral committee is also charged with conduct of the final examination of the doctoral candidate

For the defence of the dissertation (final oral examination), the committee will be supplemented by an independent, external examiner who, as an expert in the field in which the candidate's research is carried out, will appraise the dissertation and ordinarily will also be present at the final oral examination.

The external examiner will be recommended by the doctoral committee, subject to the approval of the program area and the Dean of Graduate Studies. The external examiner must not be involved in the preparation of the dissertation before it is submitted to him or her for final evaluation.

If the research involves information gathered from or about human participants (including primary data collection, use of human biological materials, and secondary uses of information), the faculty supervisor and graduate student are responsible for the ethical conduct of the study, the completion of the project as described in the ethics application cleared by the Research Ethics Board (REB) and the protection of the rights and welfare of human participants. The supervisor ensures that all required clearances and permissions are obtained prior to commencement of the research. The graduate student and faculty supervisor submit an application to the Research Ethics Board (REB) Research involving human subjects cannot begin until ethics clearance has been obtained. (Consult with the Research Ethics Board (REB)).

All research conducted at the University of Windsor is subject to the institutional policies as described in Research Integrity and the Responsible Conduct of Research and University of Windsor Guidelines for Research Involving Human Research Participants. If the research involves animal care, biohazards, health and safety, radiation, or any other procedure that requires certification, the supervisor of the research is responsible for obtaining prior approval from the respective committees. (Consult with the Office of Research and Innovation Services).

The Dissertation for the Degree of Doctor of Philosophy
A dissertation embodying the results of an original investigation in the field of specialization is required of all candidates for the degree of Doctor of Philosophy.

The regulations of individual programs should be consulted for details of their dissertation procedures. The general format is prescribed in the Guidelines for Major Papers, Theses, and Dissertations, which may be obtained from the Faculty of Graduate Studies or from www.uwindsor.ca/graduate. Within the dissertation, the student should use formats approved for scholarly publication in the field of specialization and approved by the program. Final checking of the general format of the dissertation is the responsibility of the Faculty of Graduate Studies, but the student should consult the doctoral committee for instructions as to the internal form of the dissertation.

Copies of a PhD dissertation are to be provided to all members of the doctoral committee and two copies to the Faculty of Graduate Studies, of which one copy will be transmitted to the external examiner, at least four weeks before the expected date of defence. Before the dissertation is forwarded to the external examiner, all members of the doctoral committee must read and provide feedback on the dissertation, and it must be approved by the majority of the committee. No changes may be made to the dissertation document or composition of the doctoral committee between these deadline dates and the defence except under the most extraordinary circumstances and with approval of the Executive Committee of Graduate Studies. The oral presentation should be completed at least three weeks prior to the Convocation for which the candidate has applied to receive the degree. A public notice of defence must be received in the Office of Graduate Studies and posted in the academic unit at least eight days in advance of the oral presentation.

A doctoral committee shall notify the Faculty of Graduate Studies whether, in its view, notice of defence is to be posted, but the decision to proceed shall be contingent upon the report of the external examiner to the Dean of Graduate Studies.

The candidate will present the dissertation at a public defence. The Chair of a PhD defence will be the Dean of Graduate Studies or designate, such as the Associate Dean of Graduate Studies, Dean of a Faculty or senior member of graduate faculty from outside the program, to be named by the Dean of Graduate Studies at the time the defence is publicly announced. The chair is non-voting. Questions will be permitted from the general audience at the discretion of the chair. The general audience may remain until the defence is completed and the committee begins its deliberations on the outcome. These deliberations are held in camera.

The minimum basis for acceptance of a PhD dissertation shall be positive unanimity less one vote providing the dissenting vote is not by an external examiner who is present at the defence, and the chair of the defence determines that the examination by the external examiner has been fair to the candidate. Unless an examining committee is unanimously negative, a candidate may resubmit the dissertation once, after a minimum period of three months and before a maximum period of twelve months. The second decision shall be final. Grades of Satisfactory/Unsatisfactory will be assigned for dissertations.

The dissertation must be deposited with the Faculty of Graduate Studies at least two weeks prior to Convocation.

Arrangements for the deposit, including online electronic submission, binding the dissertation and payment of binding fees, where applicable, should be made with Graduate Studies. The University will add the dissertation to the “Scholarship at UWindsor” online institutional repository and transmit a copy of the dissertation to Library and Archives Canada, under the authority of a "Thesis/Dissertation Non-Exclusive License", supplied by the Faculty of Graduate Studies and validated by the candidate. The

license authorizes Library and Archives Canada and Leddy Library to publish, reproduce, and transform the dissertation in any format, print or online. The deposited dissertation becomes the property of the University.

Occasionally, it is necessary to withhold the dissertation from public circulation, especially where the student's interests (e.g., patent rights) would be jeopardized by publication. In such cases, a thesis may be held from the public domain, i.e., the online repository, the Leddy Library and Library and Archives of Canada. Such delay in circulation may be requested for six months without cause being given, and an additional period of six months with good cause. Forms for withholding dissertation are available from the Faculty of Graduate Studies.

Dissertation Requirement Synopsis for the Doctor of Philosophy

1. Dissertation format must be as prescribed in Guidelines for Major Papers, Theses, and Dissertations.

2. Copies of the dissertation must be provided to all committee members and two copies to the Faculty of Graduate Studies at least four weeks before the oral defence, which must occur at least three weeks prior to the Convocation at which the candidate has applied to receive the degree.

3. Public notice of defence must be received in the Faculty of Graduate Studies and posted in the academic unit at least eight (8) days in advance of the defence date.

4. Following successful defence, the candidate will deposit the dissertation in the Faculty of Graduate Studies, as prescribed in Guidelines for Major Papers, Theses, and Dissertations.

5. The candidate will validate a “Thesis/Dissertation Non-Exclusive License”, supplied by the Office of Graduate Studies, authorizing Library and Archives Canada to publish, and reproduce the dissertation.

PhD Examinations
In addition to the usual examinations on course work, there are three types of special examinations which that may be required (see individual program regulations) in the program leading to the degree of Doctor of Philosophy:

1. **Qualifying Examinations**: A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in the major subject; it is designed to test the student’s preparation for advanced graduate work. If such an examination is required, it must be administered and passed within one year after a student enters a graduate program.

2. **Comprehensive Examinations**: A comprehensive examination is one in which the student is asked to demonstrate a reasonable mastery of the field of specialization; it is designed to test the student’s command of knowledge and ability to integrate that knowledge, after completion of all or most of the graduate course work. Normally, these examinations are completed by the end of the second year of graduate study and are a prerequisite to admission to candidacy.

3. **Final Examinations**: The final examination of a doctoral candidate is an oral defence of the dissertation.

FACULTY REGULATIONS FOR THE MASTER'S DEGREE

Admission Requirements
Graduates of recognized universities may be admitted to programs leading to the Master's degree. A student with a four-year degree or equivalent in the discipline to which s/he is seeking admission, and who has an academic standing equivalent to 70% or better in the final two years of study (full time equivalent) may be admitted to a Master's program (M2).

An applicant who holds a four-year degree in a related discipline, and who has an academic standing equivalent to a 70% or better overall and in the final year of study and the major subject, may also be admitted to a Master's program as a transitional student. Transitional students are normally required to complete a program of no more than five specified undergraduate courses in addition to the graduate courses required of regular students. Upon completion of these extra courses, with a minimum grade of 70% in each course, the student may continue in the Master's program as a regular student (M2).

An applicant who does not meet minimum departmental program admission requirements, but who can present evidence of leadership, and/or substantial related work experience, may be considered for probationary admission upon the recommendation of the program. Students who are accepted on probation will be required to satisfactorily complete two specified graduate courses in the first term of registration, in addition to any other admission requirements, before conditions are waived. Graduate credit will be given for the graduate courses after the conditions are waived. The final decision on probationary admission rests with the Faculty of Graduate Studies.

An applicant who holds a three-year degree in the discipline to which they are applying, or a four-year degree in another discipline, and who has an academic standing equivalent to 70% or better overall and in both the final year of study and major subject may be admitted as a qualifying student, with a recommendation for advancement to M2 level contingent upon completion of a prescribed set of qualifying courses, with a minimum grade as specified by the program. Since qualifying students are not candidates for a degree, a qualifying student is not considered a graduate student (M1).

Applicants are urged to apply as early as possible to enable the program and the Faculty of Graduate Studies to evaluate qualifications. Possession of the minimum requirements does not ensure admission.

Candidacy: A student in an M2 program is also a candidate for the Master's degree. Students in the two-year M1 program followed by the M2 program are not admitted to candidacy until they have satisfactorily completed the M1 program. A positive recommendation from a program and approval of that recommendation are required for a student to proceed to the M2 program.

Program Requirements for the Master's Degree

Residence
Residence requirements are intended to provide for each student an adequate contact with the University, faculty in the field of specialization, the library, laboratories, and with other facilities for graduate study. It is expected, therefore, that every full-time student in a program leading to the Master's degree will undertake a full program of study at the M2 level for a minimum of one calendar year or its equivalent. Application and interpretation of the residence requirement is the responsibility of the Dean of Graduate Studies. If a student does not expect to fulfill the residence requirement in the normal way, reasons for departing from the norm should be submitted in writing to the Dean and approval secured for the plan before beginning the graduate program. See also the section on "Duration of Study".

The residency requirement is not intended to apply to students admitted to graduate programs on a part-time basis.

Duration of Study
The minimum duration of study for the Master's degree is one calendar year beyond the honours Bachelor's degree, or its equivalent.

Transfer credits will only be granted at the time of admission, and recommendations must be included with the offer of admission. Normally, credits must have been received in the last 5 years with a minimum grade of 70%, and no credits used towards a previously completed certificate, diploma, or degree or used as a basis of admission will be approved as credit toward a Windsor graduate degree. A maximum of 50% of the Windsor course degree requirements will be approved for transfer credit, excluding internship/practicum, thesis, dissertation, or comprehensive examination courses.

If transfer credit is granted, the student may be required to take additional courses. Residency still applies. Approved transfer credit will appear on the student's transcript.

Time Limit
Work on a Master's degree must be completed within three consecutive calendar years after the student's first registration, except for certain Master's programs available on a part-time basis. In these latter programs, the time limit will depend on the nature of the program but will not normally exceed five consecutive years.

If an extension of these time limits becomes necessary, the student should address a petition to the Dean of Graduate Studies giving reasons for the request and plans for the completion of the work. A student who exceeds the time limit may be required to take additional qualifying examinations or additional course work, or both.

Course of Study
Course requirements are specified in the program listings. Planning and direction of the student's course of study are the responsibility of the program area. A specific program of study should be worked out at the time of the student's first registration, in consultation with the program area. Students are directed to obtain the approval of the program area for changes in the program of study. Training in methodology may be required, at the discretion of the program.

In consultation with their program, all students must complete an Annual Report which is to be submitted to their program by May 31 of each year.

Students working toward the Master's degree must maintain at least a 70% average in all course work. See also Senate Policy on Grading and Calculation of Averages for details including restrictions on repeating courses.

Declaration of Conflict of Interest in Supervision
A conflict of interest (COI) exists if a supervisor, co-supervisor, and/or committee member has a financial or close personal relationship (e.g., romantic, sexual, marital, or familial) with a student over whom they have a supervisory or evaluative role.

Should such a relationship between a supervisor and student develop, the supervisory relationship will be terminated, and the Graduate Program Chair may act as supervisor for the student until a new supervisor can be determined. The former supervisor, co-supervisor and/or the academic unit may

remain responsible for the maintenance of any existing or promised financial support until appropriate supervision can be found in consultation with the Dean of Graduate Studies or their designate.

Likewise, a COI exists if supervisors, co-supervisors, and committee members have a financial or close personal relationship (e.g., romantic, sexual, marital or familial) with one another. Should such a relationship develop or be identified, the program may take one of the following options to mitigate the COI;

1. one or more of the individuals involved may resign from the committee so that only one person involved in the relationship remains a member of the committee, or; 2. an additional committee member will be added.

In the case that a Graduate Program Chair is also a student's supervisor, another Graduate Committee Chair (e.g., Department Head) may be named for that student throughout the supervisor's tenure in that role.

Committees

Research undertaken as part of a Master's program is normally directed by a faculty supervisor and advised by a Master's committee. By the end of the first term of registration in the thesis, the program will recommend the appointment of members of the Master's committee, whose appointments must be approved by the Faculty of Graduate Studies. At the same time the candidate will be required to validate the Non-Exclusive License to the University of Windsor authorizing the University to archive, reproduce, and distribute the thesis.

The master's thesis committee will include a research supervisor from the program who holds full graduate faculty status, and two other readers from the University of Windsor. The majority of committee members must have full graduate faculty status, including the Supervisor and one other reader. If there are co-supervisors one of the two must be from the program and hold full graduate faculty status. The other must hold either affiliate or full graduate faculty status. See Senate Policy on Graduate Faculty Designation.

Additional members may be added with the approval of the program and the Faculty of Graduate Studies.

The Master's committee is also charged with conduct of the final examination of the Master's candidate.

If the research involves information gathered from or about human participants (including primary data collection, use of human biological materials, and secondary uses of information), the faculty supervisor and graduate student are responsible for the ethical conduct of the study, the completion of the project as described in the ethics application cleared by the Research Ethics Board (REB) and the protection of the rights and welfare of human participants. The supervisor ensures that all required clearances and permissions are obtained prior to commencement of the research. The graduate student and faculty supervisor submits an application to the REB. Research involving human subjects, cannot begin until ethics clearance has been obtained. (Consult with REB.)

All research conducted at the University of Windsor is subject to the institutional policies as described in Research Integrity and the Responsible Conduct of Research and University of Windsor Guidelines for Research Involving Human Research Participants. If the research involves animal care, biohazards, health and safety, radiation, or any other procedure that requires certification, the supervisor of the research is responsible for obtaining prior approval from the respective committees. (Consult with the Office of Research and Innovation Services)

Thesis or Major Paper for the Master's Degree

A thesis incorporating the results of an investigation in the field of the major subject may be required of candidates for the Master's degree.

Candidates for some Master's programs may choose, instead of the course of study including a thesis, a program requiring additional course work and/or the submission of a major paper or project on which there will be a final evaluation.

The Major Paper/Project is a scholarly essay/research project that shows evidence of critical analysis and understanding on a topic approved by the student's supervisor and acknowledged by the program area.

The Major Paper/Project committee will include a supervisor, who is a member of graduate faculty, and one other program faculty member. Additional members may be added with the approval of the program area.

Upon completion of the Major Paper/Project each student will deliver a public oral presentation and defence which shall be announced publicly (with a copy sent to the Faculty of Graduate Studies) at least eight days in advance.

The Major Paper/Project is deposited in the Faculty of Graduate Studies at least two weeks prior to Convocation.

The regulations of individual programs should also be consulted for details of their thesis or major paper/project requirements. A grade of Satisfactory/Unsatisfactory will be assigned for theses and major papers/projects.

Although in some cases it may be acceptable for more than one candidate to make use of a common set of data or research findings, each candidate is responsible for a single-authored thesis/major paper.

The regulations of individual programs should be consulted for details of their procedures. The general format is prescribed in Guidelines for Major Papers, Theses, and Dissertations, which may be obtained from the Faculty of Graduate Studies. Within the thesis or major paper/project, the student should use formats approved for scholarly publication in the field of specialization and approved by the program. Final checking of the general format of the thesis or major paper/project is the responsibility of the Faculty of Graduate Studies, but the student should consult the Master's committee for instructions as to the internal form of the document.

Copies of the Master's thesis must be provided to all members of the Master's committee and one copy to the chair of the defence, at least two weeks before the expected date of defence. Students are advised to ascertain from the academic unit any prior deadline established by the unit. No changes may be made to the thesis or the Master's committee between these deadline dates and the defence except under the most extraordinary circumstances and with the approval of the Faculty of Graduate Studies. The oral presentation should be completed at least three weeks prior to the Convocation at which the candidate expects to receive the degree.

No later than eight days before a proposed defence a Master's committee shall notify the Office of Graduate Studies that a notice of defence is to be posted. The chair of a Master's defence will be a member of graduate faculty who has not served on the candidate's Master's committee, and who is appointed by the Department Head at the time the defence is publicly announced. The chair is non-voting. The general audience may remain until the defence is completed and the committee begins its

deliberations on the outcome. These deliberations are held in camera. The minimum basis for acceptance of a Master's thesis is positive unanimity by the examining committee less one vote. Unless an examining committee is unanimously negative, a candidate may resubmit the thesis once, after a minimum period of three months and before a maximum period of twelve months. The second decision shall be final. Grades of Satisfactory/Unsatisfactory will be assigned for dissertations.

The thesis must be deposited in the Faculty of Graduate Studies at least two weeks prior to Convocation.

Arrangements for the deposit, including online electronic submission, binding the dissertation and payment of binding fees, where applicable, should be made with Graduate Studies. The University will add the dissertation to the “Scholarship at UWindsor” online institutional repository and transmit a copy of the dissertation to Library and Archives Canada, under the authority of a "Thesis/Dissertation Non-Exclusive License", supplied by the Office of Graduate Studies and validated by the candidate. The license, authorizes Library and Archives Canada and Leddy Library to publish, reproduce, and transform the dissertation in any format, print or online.

The deposited thesis becomes the property of the University.

Occasionally, it is necessary to withhold the thesis or major paper/project from public circulation, especially where the student's interests (e.g., patent rights) would be jeopardized by publication. In such cases, a thesis or major paper/project may be held from the public domain, i.e., the online repository, the Leddy Library and Library and Archives Canada, where applicable. Such delay in circulation may be requested for six months without cause being given, and an additional period of six months with good cause. Forms for withholding a thesis or major paper/project are available from the Faculty of Graduate Studies.

Thesis/Major Paper Requirements Synopsis for the Master’s Degree
1. Thesis or Major Paper format must be as prescribed by Guidelines for Major Papers, Theses, and Dissertations.

2. Copies of the thesis for Master's degree must be provided to all committee members, and one copy to the chair of the defence at least two weeks before the oral presentation, which must occur at least three weeks prior to the Convocation at which the candidate has applied to receive the degree.

3. Public notice of the defence must be received in the Office of Graduate Studies at least eight days in advance of the defence date.

4. Following successful defence, the candidate will deposit the thesis/major paper in the Office of Graduate Studies, as prescribed in Guidelines for Major Papers, Theses, and Dissertations.

5. Thesis only. The candidate will validate a "Thesis /Dissertation Non-Exclusive License", supplied by the Office of Graduate Studies, authorizing distribution to Library and Archives Canada.

Examinations for the Master’s Degree
In addition to the usual examinations on course work, the final examination of a candidate for a Master's degree is an oral defence of the thesis, major paper, or project.

ADDITIONAL DEGREES

The Senate Policy on Additional Degrees can be found online on the Central Policies website at: www.uwindsor.ca/policies.

EXAMINATIONS AND GRADING PROCEDURES

A program may require either oral or written examinations in graduate courses. By the first day of each course, the instructor must provide students with a written course outline which includes precise information concerning the following (see Bylaw 55: Graduate Academic Evaluation Procedures for complete details):

(a) the basis for determining the final grade in the course
(b) the approximate dates for tests, essays, etc.

Note, as per Senate Bylaw 55, alterations in the announced procedure may be made by the instructor with the consent of the majority of the registered class.

APPEALS

In addition to appealing a grade informally (see Bylaw 55), students may formally appeal a grade.

Graduate appeals must be made in writing to the Dean of Graduate Studies, in accordance with the Graduate Appeals Policy as stated in Senate Bylaw 55: Graduate Academic Evaluation Procedures. Appeals must be received no later than three weeks after the final mark has been released by the Registrar.

REQUEST FOR CONSIDERATION BASED ON MEDICAL OR COMPASSIONAL GROUNDS

As per Senate Bylaw 55, a student who wishes to receive consideration based on medical or compassionate grounds should communicate with either the instructor or the Head of the AAU, or designate (e.g., program coordinator), offering the course as soon as possible. The form, Graduate Request for Consideration (for Health, Bereavement, or Extenuating Circumstances), should be completed and is available on the Office of the Registrar Forms and Application for Students page applications).

A letter of rationale and supporting documents (e.g. the attending physician's letter) must be included. In such cases, the instructor may grant an aegrotat grade based on term work or assign an "incomplete" grade indicating what further work is required and the deadline by which such work must be completed. It is recommended that at least 60% of the term work be completed in these cases. The instructor's response will be forwarded by the Head of the AAU offering the course to the Dean of Graduate Studies who, on the recommendation of the program and the Academic Standing Committee, may grant aegrotat standing in the subject(s) concerned on the basis of the term mark, approve an Incomplete grade, grant permission for a supplemental examination, or other accommodation.

POLICY ON GRADING AND CALCULATION OF AVERAGES

The Senate Policy on Grading and Calculation of Averages can be found online on the Central Policies website at: www.uwindsor.ca/policies

AUTHORSHIP

The Senate approved Policy on Authorship can be found online on the Central Policies website at: www.uwindsor.ca/policies

PLAGARISM

A confirmed incident of plagiarism will result in a sanction ranging from a verbal warning to a loss of credit in the course, to expulsion, as per Bylaw 31: Academic Integrity. In case of any doubt, students are strongly urged to consult with the instructor or thesis supervisor. In cases where students feel that their intellectual property or copyrighted material has been plagiarized, complaints should be made in writing to the Dean of Graduate Studies.

The Graduate Studies Policy on Plagiarism can be found online on the Central Policies website at: www.uwindsor.ca/policies

GRADUATION

In order to allow the necessary time for the printing of the diploma and the Convocation program, the candidate's completed work must be approved by the Faculty of Graduate Studies and the major paper, project, thesis or dissertation, if one is presented, must be received by the Faculty of Graduate Studies at least two weeks before Convocation following requirements prescribed in Guidelines for Major Papers, Theses, and Dissertations.

Registration in any program does not constitute an application for a degree or diploma. An application to graduate must be filed with the Registrar's Office by the specified date prior to the Convocation at which the applicant expects to graduate.

For more information visit the Office of the Registrar at http://www.uwindsor.ca/registrar/

APPLICATION/ADMISSION INFORMATION

APPLICATION INFORMATION

Application for admission may be made online at www.uwindsor.ca/graduate.

Applicants are advised to check departmental listings for deadlines. If an earlier deadline is not specified, complete applications, and the application fee should be submitted no later than July 1 for September admission, November 1 for January admission, and March 1 for May admission; however, applicants are advised that offers of admission will be made prior to and following these dates to qualified applicants. All positions may be filled before the deadline dates. Early applications are advised.

International applicants are required to obtain a student visa. This is the sole responsibility of the applicant. Applicants are advised that Canadian government processing of visa applications may take several months. It is recommended that international students apply at least 6-8 months prior to the semester in which they desire admission.

Admission to the Faculty of Graduate Studies is by letter of offer from the Dean of Graduate Studies.

A decision to admit or not to admit is made by the Dean on the basis of a recommendation received from an academic unit, together with the documents required for admission.

Applicants who have not been admitted to the Faculty of Graduate Studies may upgrade their qualifications and reapply. A subsequent decision would be made on the basis of a further recommendation from the academic unit and the updated file.

DEFERRED APPLICATIONS

Offers of admission are made for a specific term, and, with the approval of the program, acceptance may be deferred for the next available term only. Students wishing to be considered for admission at a later date will normally be required to complete a new application and to resubmit their documents.

DOCUMENTATION REQUIRED FOR ENGLISH LANGUAGE PROFICIENCY REQUIREMENT

All documents received become the property of the University and will not be returned. Action will be taken on an application for admission when all the documents listed below have been received:

1. The online application form properly completed.

2. One copy of official or unofficial transcripts of all undergraduate and graduate work from all colleges or universities attended. If an offer of admission is extended on the basis of unofficial transcripts, final official transcripts must be submitted by the deadline on the offer of admission.

3. Completed Confidential Report forms as required.

4. Any additional program requirements, e.g., GMAT, GRE, writing sample, portfolio.

5. For applicants whose native language is not English, see the Senate Policy on Graduate English Language Proficiency Requirement.

The Senate on Graduate English Language Proficiency Requirement can be found online on the Central Policies website. www.uwindsor.ca/policies

ADMISSION LEVELS

An applicant may be admitted to a graduate program as a master's student, qualifying master's student, transitional master's student, probationary Master's student or a PhD student.

Master's Qualifying Admission (M1): An applicant who holds a three-year degree in the discipline to which s/he is applying, or a four-year degree in another discipline, may be admitted as a qualifying student, with a recommendation for advancement to the M2 level contingent upon completion of a prescribed set of qualifying courses, with a minimum grade as specified by the program. Since qualifying students are not candidates for a degree, a qualifying student is not considered a graduate student.

Regular Admission (M2): Applicants who hold a four-year degree or equivalent in the discipline to which they are seeking admission may be admitted to this level.

Transitional Admission (M2): An applicant who holds a four-year degree, but not one in the discipline to which s/he is applying, may be admitted to a Master's program as a transitional student. Transitional students are normally required to complete a program of no more than five (5) specified undergraduate courses in addition to the graduate courses required of regular students. Upon completion of these extra courses, with a minimum grade as specified by the program, the student may continue in the Master's program as a regular student.

Probationary Admission (M2): An applicant who does not meet the minimum departmental program admission requirements, but who can present evidence of leadership, and/or substantial related work experience, may be considered for probationary admission upon the recommendation of the program. Students who are accepted on probation will be required to satisfactorily complete two specified graduate courses in the first term, in addition to any other admission requirements, before conditions are waived. Graduate credit will be given for the graduate courses after the conditions are waived. The final decision on probationary admission rests with the Faculty of Graduate Studies

PhD Admission: Applicants who hold a Master's degree or, in exceptional cases, a four-year Bachelor's degree, may be admitted to this level.

REGISTRATION

REGISTRATION

Students whose applications for admission to graduate study have been approved for full- or part-time study should present themselves to their program advisors prior to registration based on the Registrar's Important Academic Dates.

CATEGORIES OF REGISTRATION

Categories of Registration includes definitions of "full-time graduate student" and "part-time graduate student"

It is the expectation that all graduate students are admitted on a full-time basis, although some programs may offer part-time admission on an exceptional basis.

Full-Time Student: A student who is admitted to a program on a full-time basis is one who is geographically available and visits the campus regularly. Graduate students must be continuously present at the university for each term in which they are registered. It is understood that a graduate student may be absent from the University while still under supervision, e.g., visiting libraries, attending a graduate course at another institution, doing field work, etc. Any such absence from the University must be approved by the program.

Part-Time Student: Some graduate programs are available on a part-time basis, and students may be admitted to such programs as part-time registrants. Students must petition the Graduate Program and Faculty of Graduate Studies for permission to transfer to part-time status. Part-time registration in full-time programs may be granted in exceptional circumstances and only with the approval of both the Graduate Program and Faculty of Graduate Studies. Supporting documentation must be submitted with the request. Students interested in part-time studies should first consult the program.

Full-time employees of the University enrolled in graduate programs may only have part-time status.

Note: Part-time students may not take more than one course in any term. Concurrent registration in a course and in a thesis or dissertation (not major paper) will be permitted.

GRADUATE REGISTRATION REGULATIONS

Graduate registration regulations include information on leaves of absence, non-degree registration and auditing courses.

1. Graduate students must register before the appropriate deadline or they will not receive credit for academic work they may be doing during the term. Note: Registration is not complete until the appropriate fees have been paid.

Students completing all requirements for the degree within the first few weeks of a term may be eligible for a tuition refund for that term. (Consult the Faculty of Graduate Studies.)

2. Full-time students are required to maintain continuous registration through all terms of their graduate program. Failure to do so will require application for readmission to their program and payment may be required for terms missed, up to a maximum of three terms.

3. In accordance with the circumstances listed below, a student may apply to the Dean of Graduate Studies for, and may be granted, a leave of absence.

Maternity Leave: Graduate students may request a maternity leave for no more than three consecutive terms without prejudice to their academic standing. Time limit/funding eligibility will be extended by the duration of the leave.

Paternity Leave: In recognition of a father's role, a graduate student may request paternity leave for no more than one term without prejudice to their academic standing. Time limit/funding eligibility will be extended by the duration of the leave.

Parental Leave: Parental leave is intended to recognize that there may be a need for a pause in studies in order to provide full-time care in the first stages of parenting a child. Either or both parents may request one term of leave without prejudice to their academic standing. The request for leave must be completed within twelve months of the date of birth or custody. Time limit/funding eligibility will be extended by the duration of the leave.

Financial Leave: In the case of financial necessity, primarily as evidenced by the support awarded through the University, a student shall be granted a leave of no more than one term out of three upon application (not available to part-time students.) Time limit/funding eligibility will not be extended by the duration of the leave.

Medical Leave: Graduate students may apply for a leave of absence on medical grounds for up to three terms without prejudice to their academic standing. Students are required to provide documentation to support a medical leave of absence. Time limit/funding eligibility will be extended by the duration of the leave.

Personal Leave: Graduate students may apply for a leave of absence on grounds of serious personal circumstances for up to three terms Time limit/funding eligibility will be determined on a case-by-case basis.

A term is defined as a four-month period coinciding with the academic calendar (January to April; May to August; and September to December).

While on leave, a student will not have access to any university resources, including office space, computer access, library facilities, continuation of laboratory experiments, computer research applications, and guidance by faculty members.

Apart from the combination of maternity or paternity and parental leave, sequentially combining two leave of absence classifications is allowable only in special and extenuating circumstances.

Applications for a leave of absence must be submitted to the student's department for recommendation before the end of the second week of the term. A student on leave of absence will be assessed a fee per term. Appeals against any decisions shall be heard promptly by the Faculty of Graduate Studies.

4. Part-time students must register in every session in which the facilities of the University are to be utilized, whether in residence or off-campus. This includes those who are consulting with faculty

members while working on a major paper, thesis, or dissertation. Part-time students who have not registered for more than one terms will be required to apply for readmission, and their applications will be considered on their merits in the light of the then prevailing conditions and circumstances.

5. Students are reminded that they will not receive credit for courses for which they are not properly registered or for courses completed during terms in which the student has not paid fees.

Once a student has registered, course changes or withdrawal after the published deadlines require permission from the Dean of Graduate Studies. Subjects dropped without permission from the Dean will be regarded as failures.

Non-Degree Registration: A student who is not interested in admission as a degree student may be allowed to register for individual courses on a non-degree basis. The maximum number of courses taken overall on this basis is two. Only students who have been admitted to a graduate program may receive graduate credit at the University of Windsor for courses taken.

Audit Student: An audit student in any course is one who attends the course without credit toward a degree or program. Such a student will not be allowed to write examinations and cannot be graded in any way. The student will pay the regular fees for the course(s).

AWARDS AND FINANCIAL AID

ELIGIBILTY FOR GRADUATE FUNDING

Full-time graduate students in research-based programs may receive funding from three main sources: scholarships (internal and external), Graduate Assistantships (GAs), and Research Assistantships (RAs). This latter category is Department or even supervisor specific. Eligibility for the first two, scholarships and GAs, are subject to constraints dictated by the funding sources and, in the case of GAs, by the Collective Agreement and the Department.

One of the constraints upon funding eligibility is temporal and depends upon continuous registration. Support from the University of Windsor at the Master's level may be offered within the first two years (six terms) from the first term of registration at the Master's level (M2). Support from the University of Windsor at the Doctoral level may be offered within the first four years (twelve terms) from the first term of registration at the Doctoral level (D2). While external awards are administered according to rules defined by the source agencies, and these can differ slightly from program to program, their rules regarding eligibility are similar to the above listed.

In order to retain support once it is awarded, students must maintain continuous full-time registration; rare exceptions can be made to accommodate a Leave of Absence for medical, maternity or paternity leave. Where leave is granted for other reasons, the term(s) on leave will diminish the number of terms that a student was eligible to receive support.

Failure to register by the posted late registration deadline for each semester will result in forfeiture of support for that semester. Students who are eligible to apply for external awards are obliged to do so, or they may forfeit their funding from the University of Windsor.

For up-to-date detailed information on the funding available to graduate students, please refer to the website of the Faculty of Graduate Studies at www.uwindsor.ca/graduate.

GRADUATE FACULTY DESIGNATION

The regulations for Graduate Faculty designation are outlined in the Senate Policy on Graduate Faculty Designation.

FACULTY OF GRADUATE STUDIES

PROGRAMS

Graduate Diploma in University Teaching (UTD)

Admission Requirements
Graduate students registered in a University of Windsor graduate program, and in good academic standing, are welcome to apply to the Graduate Diploma in University Teaching. Applicants must provide:

- Date of Expected Graduation from the Primary Degree Program
- Curriculum Vita
- Personal Statement (500-750 Words):
  - What interests you about teaching in higher education?
  - What do you hope to achieve by taking this program?
  - How do you see this program complementing your primary degree?

Past teaching experiences or specific pre-requisites are not required. Program enrolment will be limited to 20 students annually to allow for experiential learning opportunities (teaching, designing assessments, developing courses, etc.) and multiple opportunities to engage in small group discussion, and provide and receive ongoing feedback. Preference will be given to students who are required to complete the GDiP in University Teaching as a component of their primary degree or who are enrolled in UWindsor PhD programs. Applications will be considered on a case-by-case basis.

We recommend that you consult with your supervisor in your primary program before applying to this program.

For more information visit: https://www.uwindsor.ca/ctl/gdip

Degree Requirements
Core Course:
CTLP-8100. Learning Centred Teaching in Higher Education (1.5 credits)
CTLP-8200. Course Design (1.5 credits)
CTLP-8300. University Teaching Capstone (3.0 credits)

Take two from the following
CTLP- 8110. Lecturing (1.5 credits)
CTLP- 8120. Leading Effective Discussions (1.5 credits)
CTLP- 8210. Authentic Assessment (1.5 credits)
CTLP- 8220. Scholarship of Teaching and Learning (1.5 credits)
SCIE-8001. STEM Teaching Development (3.0 credits)

GRADUATE DIPLOMA IN UNIVERSITY TEACHING COURSES (CTLP-)

CTLP-8100. Learning-Centred Teaching in Higher Education
This course offers the opportunity to explore and evaluate the principles and theories of learning-centred teaching in higher education. Through a diverse range of class activities, readings, reflection, and peer-reviewed class facilitation, students will develop skills in teaching critical thinking; mentorship; and active learning. Students will also use research findings and reflection on teaching practice to inform their own teaching development. This course is of particular interest to graduate students and instructors, but prior teaching experience in higher education is not a prerequisite. (Prerequisite: Admission into a graduate program.)

CTLP-8110 Lecturing
This course will introduce students to the skills and techniques of effective lecturing. Students will explore storytelling, rhetoric, nonverbal communication, as well as additional theories and approaches to creating and delivering lectures that are clear, well-organized, engaging, and learning-centred; and will be able to adapt these strategies to suit their own personal teaching style and disciplinary needs. Students will also have the opportunity to apply the skills and concepts they are learning by designing and delivering microteaching sessions and providing and receiving constructive feedback from peers. (Prerequisite: Admission into a graduate program.)

CTLP-8120 Leading Effective Discussions
This course introduces students to the skills and theories involved in leading and sustaining educationally effective discussions. Students will experience a variety of discussion-based active learning lessons, and will have an opportunity to facilitate a discussion, and receive feedback on their teaching. By the end of this course, students will be in a better position to judge which methods they would like to use in their own classes, and how they can be adapted to suit personal teaching styles and disciplinary needs. (Prerequisite: Admission into a graduate program.)

CTLP-8200. Course Design
This course introduces participants to the principles and practice of effective course design, including developing effective outcomes, designing learning experiences to help students master difficult concepts, and creating effective and aligned assessment plans. Participants will have the opportunity to design (or redesign) a course of their choosing, receiving feedback at each step. (Prerequisites: Admission into a graduate program.)

CTLP-8210 Authentic Assessment
This course explores the principles and practice of authentic assessment of student learning. Authentic assessment is a type of assessment which assesses what students know, value, and can do in a way that is well-integrated into the entire learning environment of a course and considers the contexts in which learning might be used once students leave the university. Students will learn how to create assessments that are aligned with intended learning outcomes, and will be able to design reliable, valid, and meaningful assessment measures that motivate students and help them learn. (Prerequisite: Admission into a graduate program.)

CTLP-8220 Scholarship of Teaching and Learning
This course defines and interrogates the scholarship of teaching and learning (SoTL), and its value to teaching, learning, and higher education. Students will consider different types of SoTL projects and research methods, determining approaches that might help them identify and answer questions and

explore areas of interest. At the end of this course, students will have a SoTL project underway and a plan moving forward. (Prerequisite: Admission into a graduate program.)

CTLP-8230. Indigenizing Teaching and Learning in Higher Education
This course employs a two-eyed seeing approach to Indigenizing teaching and learning in higher education. Through reflection, story-telling, and dialogue, students will explore critical questions of Indigenization, what it means in the context of teaching and learning, and why it is important. In-class activities will model Indigenous pedagogies and take a relational and collaborative approach to fostering allyship, avoiding appropriation, and identifying various strategies to balance Indigenous approaches with Western conventions. Students will have the opportunity to engage in experiential, land-based, and relational learning from an Indigenous perspective and reflect on how they might apply these approaches to their own courses and disciplines.

CTLP-8300 University Teaching Capstone
This course addresses current and emerging teaching and learning issues, topics, and concerns, and serves as a forum where students can explore and challenge their teaching and learning assumptions. Students will learn about theories and models of reflective practice and communicating their teaching identity. They will also have the opportunity to observe and practice teaching and learning concepts and theories learned in the Graduate Diploma in University Teaching (UTD). As this course is the final requirement for participants in the UTD, it is expected that students have an understanding of the basic theories and principles of higher education. (Prerequisite: Admission into a graduate program; completion of UTD pre-requisites: CTLP-8100; CTLP-8200; Two of CTLP-8110, CTLP-8120, CTLP-8210, CTLP-8220, SCIE-8001)

GRADUATE COURSES (GART-)(RESG-)

GART-9000. Current Issues in Argumentation Theory
This course will introduce students to the current leading theories and theoretical controversies in argumentation theory. It will do so from a variety of perspectives, including the logical, the dialectical and the rhetorical. It will cover such topics as rhetorical vs. epistemic uses of argument, the use of ideal models in argumentation analysis, the current state of fallacy theory, relations of argumentation theory to other fields, such as law, computer science, philosophy. Prerequisites: This graduate course requires that the student have completed an undergraduate degree. Normally, the student will have completed at least two undergraduate courses in such areas as logic (formal or informal), critical thinking, argumentation, theory of argument, rhetoric, or dialectic. (Prerequisites: permission of instructor.)

RESG-8990. Interdisciplinary Master's Seminar
This course will offer graduate students in English, History, Philosophy, Political Science, Psychology, Sociology, Visual Arts, and any other graduate program with a humanities component, the opportunity, in the course of their intensive, discipline-oriented training, to benefit from an interdisciplinary experience. Topics will vary from year to year. (May be offered over two terms.)

FACULTY OF ARTS, HUMANITES AND SOCIAL SCIENCES

COMMUNICATION, MEDIA AND FILM

PROGRAMS

Master's in Communication, Media, and Digital Culture (MA)

Admission Requirements
Applicants should submit a portfolio consisting of: (i) a completed application form; (ii) a personal profile in accordance with the format prescribed by the Program; (iii) a C.V.; (iv) an official transcript of grades attained in undergraduate courses; (v) two letters of reference; and (vi) a sample of writing from undergraduate courses. Normally, successful applicants will have an Honours B.A. in Communication or a cognate discipline; however, students lacking this formal requirement but having equivalent qualifications (for example, significant experience with a social justice agency or having engaged for a significant time in social justice related activities) are also encouraged to apply. Students lacking formal admission requirements may be required to enroll in a make-up year.

Program Curriculum Structure
Students must complete five courses, three of which must be CMDC-8500, CMDC-8501, and CMDC-8502. They must also prepare a major paper which may evolve from one of the courses. The presentation of the major paper defence will be open to all faculty and students. Students completing a thesis must take four courses, three of which must be CMDC-8500, CMDC-8501, and CMDC-8502. The thesis option is available only with faculty recommendation. Courses taken in other programs may be counted for credit with the prior permission of the Graduate Coordinator.

Master of Fine Arts in Film Production (MFA)

Admission Requirements

Student admission will be determined by GPA, portfolio submission, letters of reference, and a clear statement of interest describing their intended film thesis production.

1) For admission to the Film Production Master of Fine Arts program, applicants must satisfy the following requirements:

(a) portfolio submission: submit a pdf with links for web or digital download of 3 video samples (minimum 5 minutes in total) for evaluation by the departmental graduate acceptance committee;
(b) have attained at least a 70% cumulative average;
(c) present transcripts of all university and/or college-level work;
(d) clear statement of interest;
(e) three letters of recommendation;
(f) minimum language scores for international students: TOEFL 100; IELTS 7.0; Pearson 68.

Normally, successful applicants will have an Honours BA in Film production, or a cognate discipline. Students who do not meet this requirement may be admitted as either a qualifying or transitional student.

Degree Requirements

Total Courses: Eight Courses plus Thesis

(a) One theory course: CMDC-8500 Pro Seminar
(b) Two studio production courses: FILM-8100 Studio Production and FILM-8105 Studio Post-Production
(c) FILM-8000 Graduate Research Seminar
(d) Four project development independent courses: FILM-8010 Project Development I, FILM-8020 Project Development II, FILM-8030 Project Development III, and FILM-8040 Project Development IV
(e) FILM-8050 Thesis Film

Course work will culminate in the completion of a practice-based research project comprising a short thesis film (typically 10–15 minutes) and an accompanying written exegesis of approximately 10,000 words. The thesis will identify a central research theme, articulate a clear rationale, review relevant literature, formulate a practice-based research question, outline an appropriate methodology, and provide a reflexive analysis of both the thesis film and its production process.

The thesis is worth 12 graduate credits and will be conducted under faculty supervision. Students will defend their thesis at the end of the second year before a thesis panel. Those that fail the defence will have the option to appear before the thesis panel again after 6 months.

COMMUNICATION, MEDIA, AND FILM COURSES (CMDC-)

CMDC-8500. Pro-Seminar
An introduction to research in the field of critical communication/media studies. This seminar explores the intellectual history, central debates, and current research trends of the field and encourages students to develop, and actively reflect upon, their own research interests and goals. The seminar also fosters a variety of intellectual skills and practical considerations relevant to graduate study and intellectual life (e.g., applying for scholarships, sharing research in various venues, writing for different audiences).

CMDC-8501.Critical Theories of Communication and Media
This course offers an advanced examination of core concepts, perspectives, and areas of research in the field of communication and media studies. Students will explore a range of critical theoretical approaches that are representative of those currently being used or developed by researchers in the field.

CMDC-8502. Research Methods
This course provides an overview of a range of contemporary research methods in media/communication studies. Students will develop skills to evaluate the appropriateness of methods for different research purposes, critically review extant scholarly literature, and examine the ethics and politics of the research process.

CMDC-8512.Communication and Social Movements
This course draws upon an array of relevant theoretical perspectives to examine how traditional and non-traditional forms of communication/media have been used within, and by, a variety of social movements. Students will explore the contribution of new/emerging communication technologies/platforms to social activism and social movements; representations of social movements in the context of political/economic/social change; the diversity and importance of alternative media as a central component in movements for social justice.

CMDC-8513.History of Communication Thought and Technology
This course examines the historical development of communication technology from a variety of approaches including western philosophy, critical political economy, gender studies, anti-colonialism, science and technology studies (STS), and dependency theory, among others. Communication thought from the Greeks to the present will be analyzed to develop a broader critique of dominant power relations and inequitable access to technological resources.

CMDC-8514. Political Economy of Media and Communication
The course examines the historical and intellectual roots of critical political economy and explores contemporary applications of this theoretical approach. Students will analyze how media are implicated in the power relations and structural inequalities that underpin the capitalist economy as well as how they may function as sites of resistance and activism. Topics may include analyses of media platforms, ownership structures, labour, policy and regulation, privacy and surveillance issues, and media representation.

CMDC-8515 Topics in Cultural Studies
This course surveys the historical and intellectual foundations of cultural studies and explores the contemporary relevance of this approach to understanding media and popular culture. Any range of media genres, texts, practices, institutions, signifying systems, and circuits of production/consumption

may be examined in terms of their aesthetics, representational and cultural politics, power dynamics, and ideological underpinnings.

CMDC-8518. City as Media
The seminar will explore theoretical approaches to the ways in which urban spaces, everyday life, and city stories are articulated and imagined through media, arts and technologies. Seminar participants will develop research papers and experience-based creative projects about Windsor and/or Detroit. Students will examine films, stories, sounds and other media objects that reflect the urban, but will also be encouraged to develop research methodologies that use old and new media to question and document the cities' urban and suburban life. In classroom seminars, a range of theoretical writings and media objects all oriented to the urban will be discussed. In research practice, students will work with techniques such as auto-ethnographies to develop creative documents around everyday urban life. (3-hour lecture.)

CMDC-8520.Directed Study
With the approval of the Department Head or their designate, and based on a proposed syllabus drafted in collaboration with a supervising faculty member, a student may undertake this course on a specific topic to enhance their program of study. The course will involve directed supervision of readings, informed discussion with the course supervisor, and assessments designed to ascertain student mastery of assigned materials.

CMDC-8543. Advanced Film Theory and Criticism
Films are explored under the broad rubric of cultural studies; specific theoretical approaches employed to analyze cinema are examined. Case studies of genres as the emergent effective mode of understanding films are taken up. Films selected may belong to the silent or classical period to the contemporary. The readings provide tools to analyze formal aspects and critical interpretative frameworks applied to examine films. Writing assignments forge links between the written and the visual and between theory and film texts. (3 hrs/week: once a month, class will be extended due to in-class film screening.)

CMDC-8590. Selected Topics
Selected advanced topics in Communication Studies based on special faculty interests and opportunities afforded by the availability of visiting professors. Special topics courses are subject to Graduate Committee approval. (May be repeated for credit provided that the topics differ.) (3 lecture hours a week.) (May be offered as a cross-career course with CMAF-4900).

CMDC-8960. Major Paper
(Credit Weight: 9.0)

CMDC-8970.Thesis

CMDC-8990. Internship
Application of communication skills, knowledge of diverse media, and advanced research abilities to site-specific work situations. (Prerequisites: CMDC/CASJ-8500 and CMDC/CASJ-8501).

FILM PRODUCTION COURSES (FILM-)

All project development courses are directed individual studies courses. Projects will be planned and carried out in conjunction with a faculty supervisor.

FILM-8000. Graduate Research Seminar
This seminar examines research methodologies and writing strategies designed to develop proficiency in advanced-level scholarship, supporting students as they write their thesis film script or develop their thesis documentary project.

FILM-8010. Project Development I
This course provides directed supervision in the planning of research, the development of film concepts, and the preparation of scripts for the thesis project. (This course is supervised by the Temporary Advisor.) (Open to MFA students only.)

FILM-8020. Project Development II
This course provides directed supervision in the completion of the literature review and the preproduction of the thesis project. (This course is supervised by the Temporary Advisor.) (Prerequisite: FILM-8010.)

FILM-8030. Project Development III
This course provides directed supervision in the completion of the production of the thesis film. (This course is supervised by the Primary Advisor.) (Prerequisite: FILM-8020.)

FILM-8040. Project Development IV
This course provides directed supervision in completing the post-production of the thesis film and in drafting the accompanying written exegesis. (This course is supervised by the Primary Advisor.) (Prerequisite: FILM-8030.)

FILM-8050. Thesis
Directed supervision in completing the final post-production of the thesis film and in the completion of the accompanying written exegesis. (This course is supervised by the Primary Advisor.) (Prerequisite: FILM-8040).

FILM-8100. Studio Production
Students will investigate cinematic storytelling alongside the concepts, technologies, theories, and production techniques of film and video creation through the development of a proof-of-concept or sample scene for the thesis project.

FILM-8105. Studio Post-Production
Students will investigate cinematic storytelling alongside the concepts, technologies, theories, and post-production techniques of film production through the editing, sound design, and mixing of a proof-of-concept or sample scene for the thesis project. (Prerequisite: FILM-8100.)

ENGLISH AND CREATIVE WRITING

PROGRAMS

The English department offers two fields within the MA Program in English: Literature and Language and, Literature and Creative Writing. Within the Literature and Language field, there are two options: Thesis Option and the Course Work Option. The Literature and Creative Writing field allows students to combine graduate-level study of literature with advanced work on creative writing in a two-term workshop and by developing a significant independent writing project. Within the Literature and Language field, the Course Work Option offers exposure to a wide variety of topics in literature, composition and rhetoric, and theory. The Thesis Option allows students to investigate a single topic in depth through independent, extended research with faculty supervision.

Master's in English: Literature and Creative Writing (MA)

Four graduate seminar courses
ENGL-8910. Creative Writing Seminar A
ENGL-8920. Creative Writing Seminar B
ENGL-8940. Creative Writing Project (a novel, a play, a collection of poems or short stories)

Master's in English: Literature and Language (MA)

Thesis
Five graduate seminar courses
ENGL-8970. Thesis/Project (of at least 20,000 words)

Course Work
Eight graduate seminar courses.

For both fields, students must include ENGL-8000, Scholarship and the Profession (or equivalent) in their program in addition to their regular course load.

Admission Requirements
In addition to the requirements under section titled, Application Procedures and under section titled, The Master's Degree - Admission Requirements, for admission to the Faculty of Graduate Studies and to programs leading to the Master's degree, applicants for admission to the Candidate year in the programs leading to the Master of Arts degree in English should have the following undergraduate preparation:

1. Some courses, normally four, in the pre- and early-modern periods, that is, from Old English through the Eighteenth Century;

2. Some courses, normally four, in the modern period, that is, the Nineteenth and Twentieth Centuries, including Canadian and American;

3. Some courses, normally two, from the areas of Critical History, Theory and Approaches, Scholarship and Bibliography, and Language and Linguistics;

4. Additional courses from any of the above areas to make up the total number of courses required for a four-year English BA.

Students who do not have a four-year B.A. or its equivalent may be admitted to the Faculty of Graduate Studies in a qualifying (M1) program. In such a program, the student is expected to register in appropriate undergraduate courses in order to satisfy the requirements above. Alternatively, students who are deficient in any of the stated requirements for admission may be invited or may request to write a qualifying examination (see below, "Qualifying or Placement Examination").

Students who are admitted to the Faculty of Graduate Studies in the MA program will be expected to select courses in their first year to complete the requirements specified above.

In addition to the documents required, applicants must submit a "Proposal of Studies" (about 500 words) with their applications indicating the program and option to which they are applying and discussing such issues as their areas of academic or creative interest, their undergraduate training, and their academic or career goals. Students applying to the field in Creative Writing must submit, with their application, a portfolio of representative creative work (20-25 pages). Students with a four-year B.A. in English may apply to either of the fields and to any of the options. Students with interdisciplinary interests, with honours degrees combining English with another discipline, or with abilities or backgrounds that do not correspond to the particular requirements for admission listed above, but who have an overall average of 80%, apply to either field but may be required to take additional courses.

Qualifying or Placement Examination: An applicant for admission to the Candidate year for the Master's degree who is deficient in any of the stated requirements for admission to this level of graduate study may be invited, or may request, to write a qualifying examination. A similar examination is available as a placement test, on the basis of which students in the two-year MA program may be granted advanced standing.

Students from other universities may arrange to take these examinations in other centres provided the program coordinator is notified well in advance.

Counselling: Students admitted to one of the fields of the MA program in English will be assigned a faculty advisor who will be available to counsel them on all aspects of their work. The program coordinator (or a delegate) must approve a student's program of study before registration.

Grades: After admission to candidacy, graduate students in the MA program in English must maintain at least a 70% average, but graduate credit is given only at the 80% and 70% level. A student whose grade in a graduate course is less than 70% may be allowed to repeat the course or to substitute another for it, at the discretion of the Dean of Graduate Studies and the program coordinator. The student may not repeat more than one course.

ENGLISH AND CREATIVE WRITING COURSES (ENGL-)

All graduate courses are seminars. Enrolment is limited in these courses, because considerable contribution is expected from each member of the seminar. For such courses, the corresponding undergraduate survey course, or an acceptable equivalent, is ordinarily a prerequisite. This condition may be waived only by agreement of both the program coordinator and the professor offering the seminar. The specific topics of individual courses may vary, depending upon the interests and needs of professors and students. It is thus impossible to list in detail the many topics that may from time to time be offered. The schedule below lists only the major periods or forms of literature in which special topics courses may be available. Special topics courses having the same course number may be taken more than once providing the course content is different and with the permission of both the program coordinator and the professor offering the course. More than one seminar or course numbered in sequence in any of the listed areas may be offered in a given term.

ENGL-8000. Scholarship and the Profession

ENGL-8010. Seminar
A seminar focused on a specific topic in literary, cultural, language, or rhetoric studies (May be offered as a cross-career course with ENGL-4000).

ENGL-8050. The English Language and Linguistics

ENGL-8100. Literature of the Old English Period

ENGL-8150. Literature of the Middle English Period

ENGL-8200. Literature of the Renaissance

ENGL-8250. Renaissance Drama

ENGL-8300. Literature of the Restoration Period

ENGL-8350. Literature of the Eighteenth Century

ENGL-8400. Literature of the Romantic Period

ENGL-8450. Literature of the Victorian Period

ENGL-8500. Literature of the Twentieth Century

ENGL-8550. Literature of the United States

ENGL-8600. Literature of Canada

ENGL-8650. Post-Colonial Literature

ENGL-8700. Literary Genres: Poetry

ENGL-8750. Literary Genres: Drama

ENGL-8800. Literary Genres: Fiction

ENGL-8850. Literary Genres: Criticism/Cultural Studies

ENGL-8910. Creative Writing Seminar A
The Creative Writing Seminar A is the capstone in Windsor's English program in Creative Writing. Its aim is to assist you, who have been chosen to participate in it as highly talented serious students, to become writers of distinction. The seminar will be run primarily as a workshop, where we read and discuss work-in-progress. There will also be occasional assigned reading and writing exercises, and guest speakers, for your challenge and inspiration. (May be offered as a cross-career course with ENGL-4710 (A))

ENGL-8920. Creative Writing Seminar B
The Creative Writing Seminar B is a continuation of Seminar A as the capstone in Windsor's English program in Creative Writing. (Prerequisite: ENGL-8910 or portfolio approval). (May be offered as a cross-career course with ENGL-4710 (B))

ENGL-8930.Composition Pedagogy: Theory and Practice
(Required for Graduate Assistants assigned to teach ENGL-1001.)

ENGL-8940. Creative Writing Project

ENGL-8970. Thesis/Project

HISTORY

PROGRAMS

Master's in History (MA)

Admission Requirements
The normal requirement for admission to the MA program is an honours degree in History, with at least a 75% major average in undergraduate History courses. Students with an honours degree in fields other than History will be considered on the basis of their academic background and standing and may be required to complete extra undergraduate courses as part of their program. Students with a three-year degree will be required to complete a full year (ten courses) of undergraduate courses (Masters Qualifying -- see section titled Application Procedures – Admission Levels).

Program Requirements
Students must successfully complete six courses and the Major Paper (HIST-8960), including two required courses (HIST-8030 and HIST-8040) and four additional graduate History courses. A student may, with the consent of the Graduate Advisor or AAU Head, take one course in another University of Windsor graduate program or in History at Wayne State University. Students usually complete the coursework in their first two semesters. The Major Paper will normally be written under the supervision of two History faculty members.

Although it is possible for students to complete the master's program in one calendar year (three terms in residence), many students complete in 4-5 semesters.

Degree Requirements
Total Courses: Six (6) courses plus the Major Paper
HIST-8030.Modes of Historical Interpretation
HIST-8040. Research Methods
Four 8000-level history courses
HIST-8960. Major Paper

HISTORY COURSES (HIST-)

All of the following courses will not necessarily be offered in any one year.

HIST-8030.Modes of Historical Interpretation
This course introduces students to a variety of methods and theories currently used to advance historical explanation. Particular attention will be paid to the role of narrative, the place of the social sciences, and the complexities of race, gender, ethnicity, and class in historical writing. Readings will also address the problem of synthesis, post-modernism and the relationship between history and public policy. This course also stresses the development of skills in critical reading and analytical writing.

HIST-8040. Research Methods
This course introduces students to the range of methods and approaches to historical research, and to the problems associated with interpreting various kinds of sources. Students will identify and establish a research problem, in which they define the questions to be posed, and begin to move from broad to

narrow approaches to their topic. They will discover and evaluate accessible sources of evidence, and at the same time develop an appropriate methodological and interpretive framework for a specific research project.

HIST-8060. Studies in the History of Sexuality
This course will provide a thematic approach to the foundations of Western attitudes towards sexuality, especially as they developed in premodern Europe. The complex interweaving of ancient ideas, medicine, Christian law and theology, and popular practices and beliefs will be explored. This course is problem oriented and will explore some of the theoretical issues pertaining to the historical study of human sexuality.

HIST-8070. Studies in the History of Women and Gender
This course examines the historiography and theory of these two interrelated fields since 1970. It explores the themes and approaches in early studies of women's organizations, labour, and sexuality; the later growth of attention to differences of culture and power among women; and the more recent emergence of poststructuralism and the study of the interrelation of gender, class, and race. Readings will range across time periods and national boundaries but with an emphasis on the U.S. literature.

HIST-8080. Studies in the History of the Book and the Culture of the Written Word
This course will provide an introduction to the historical problems encountered and interpretive possibilities revealed when books (both artefacts and texts) become the focus of inquiry. Ranging broadly through a variety of disciplinary approaches to manuscript and print cultures on both sides of the Atlantic, we will consider such questions as the complex uses of literacy, and the extent to which technological transformations such as the printing press or the computer have determined literary and cultural change. Studies of the book trades (printing, bookselling, journalism, publishing of all kinds) will be used to illuminate changes in religious, scientific, scholarly, literary and other aspects of the cultures (from medieval to postmodern) in which they flourish.

HIST-8090. Studies in Canadian Social History
The course discusses approaches, methods, and debates in the writing of social history in English Canada since 1970. Topics discussed include historiographical debates over the writing of a "national" history, the writing of labour and working-class history, women's history, ethnic and immigration history, the history of sexuality, regional history, and family history. How the categories of class, gender, race, ethnicity and sexuality have been incorporated into the writing of Canadian social history is a focus of consideration.

HIST-8100. Studies in Postcolonial History
This course evaluates important works of history and theory written from a postcolonial perspective. It focuses on novel approaches to studying people whose modern experience began as subordinate subjects of the West's colonizing projects. The course will also consider the influence of postcolonial scholarship on contemporary historiography in general. (2 lecture hours a week.)

HIST-8110. Modernity
This course address’s themes in the history of modernity, the lived experience of the capitalist, scientific and technological revolutions over the last three hundred years. Focusing primarily on the years from 1800-1950s, this course will begin with literature on the contemporary ideas of “being modern” in North America and Europe and the critiques of modernity by social theorists such as Marx, Gramsci and Weber. It will then turn to the historical literature on modernity, ideas of the modern and their impact on areas such as politics, the state, the workplace, economic development, education, colonial relationships, the environment.

HIST-8130. Class in the Anglo Atlantic
This course addresses the ways in which the concept of class has influenced our understanding of the past, particularly in relation to the history of working people. It reviews the "new" labour history that emerged in British and North American history beginning in the 1960s, and documents the ways in which the history of identities (race, ethnicity and gender) and postmodernism have impacted the study of class. The course examines the rise of capital and labour from their roots on the farm and plantation and in the craft shop through to modern industrial society and the contemporary effects of deindustrialization and globalization. The course furthermore scrutinizes not only the history of that experience but also the theoretical and historiographical content of class studies. (2 lecture hours a week.)

HIST-8590. Selected Topics in History

HIST-8600. Selected Topics in History

HIST-8960. Major Paper
A sophisticated scholarly essay, normally amounting to some 40-60 pages, incorporating research on primary sources (in most cases), and written under the supervision of two members of the graduate faculty, a supervisor and a second reader. There will be a public oral examination. Students are advised that they may be required to have proficiency in a language other than English in order to do their research.

PHILOSOPHY

PROGRAMS

Master of Philosophy (MA)

The aim of the program is to give students the opportunity to deepen their philosophical understanding both by broadening their undergraduate background and/or by allowing them to concentrate their studies in one of the two specific areas of focus in our program. One area is informal logic, the theory of argument, and the theory of critical thinking; the other area is twentieth-century continental philosophy and critical social theory. It is expected that theses and major papers will be written in one of these two areas. The possibility of concentrating in some other area exists but is conditional upon staffing resources, which are subject to change. The Philosophy MA program is structured in such a way as to encourage maximum participation by students in seminars and to allow extensive contact with professors outside of formal class time.

Admission Requirements
See the admissions section of the Graduate Calendar for general requirements for admission into an MA program at the University of Windsor. The Philosophy program normally requires a BA honours in Philosophy or its equivalent for regular admission to the Master's program (M-2 admission level) and a general BA in Philosophy or its equivalent for admission to the qualifying stream of the Master's program (M-1 admission level). Students are admitted to either the coursework or the major paper stream

Program Requirements
For general requirements for the Master's degree, see section titled, The Master's Degree Program Requirements. The following are particular requirements for the MA in Philosophy:

1. The student may proceed to the degree in any one of the following ways:

(a) The major paper stream
Students admitted to the major paper stream must successfully complete six graduate courses, including the Departmental Seminar (PHIL 8900), pass the MA examination, and write a major research paper (PHIL 8960). A maximum of two courses may be taken from a cognate field.

(b) The coursework stream
Students admitted to the coursework stream must successfully complete eight graduate courses, including the Departmental Seminar (PHIL 8900), and pass the MA examination. A maximum of two courses may be taken from a cognate field.

Students who wish to move from the coursework stream to the major paper stream must satisfy the following conditions: (i) complete at least six graduate courses (two of these courses may be in a cognate field), including the Departmental Seminar (PHIL 8900), with a minimum average of 80%; (ii) pass the MA examination; (iii) submit to the Graduate Coordinator a major research paper plan that was approved by the academic supervisor.

(c) The thesis stream
Students who wish to move from the coursework stream or the major paper stream to the thesis stream must satisfy the following conditions: (i) complete at least four graduate courses in philosophy, including

the Departmental Seminar (PHIL 8900), with a minimum average of 85%; (ii) pass the MA examination; (iii) submit to the Graduate Coordinator a thesis plan that was approved by the academic supervisor. In addition to satisfying these conditions, students in this stream must also write a thesis (PHIL 8970).

2. All students proceeding to the degree must pass the MA examination following the successful completion of the Departmental Seminar (PHIL 8900). In the event of a failing grade, students will be provided an opportunity to retake the exam before completing the first year of their program. Students who fail the MA examination for a second time will be asked to withdraw from the program.

3. MA Qualifying Year (M-1 admission): Students at the I Master's level are required to take PHIL-4910 (Honours Seminar) (see section titled, Philosophy Courses in the Undergraduate Calendar).

4. Program Approval: Each student must have his or her projected program approved by the Graduate Coordinator.

PHILOSOPHY COURSES (PHIL-)

GROUP A
Note: Students may receive credit for more than one offering of a course in Group A provided that the emphasis is sufficiently different. Thus, for example, credit may be received for both PHIL-8700 Recent German Philosophy: Arendt and PHIL-8700 Recent German Philosophy: Habermas where these are entirely distinct course offerings.

PHIL-8200. Topics in Ethics and Value Theory
(May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8210. Topics in Social and Political Philosophy
(May be repeated for credit if content changes and with permission of the instructor.)
(May be offered as a cross-career course with PHIL-400 (to PHIL-4100).

PHIL-8220. Topics in Environmental Philosophy
The course will focus on the conceptual foundations of the human relationship to the natural and built environment. The course may adopt either an historical or contemporary emphasis depending on the decision of the instructor. (May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8260. Philosophy of Law
The objective of this course is to introduce the student to contemporary issues concerning the philosophy of law, to include European and Indigenous law. Particular emphasis will be placed upon the presupposed relation of concepts to society. The course will examine such issues as the difference and relation of legitimacy to legality, the relation of legal analysis to social needs, the relation of morality and ethicality to the content of legal rules and legal reasoning (May be repeated for credit if content changes and with permission of the instructor.) (Prerequisite: MA Philosophy students or by instructor permission) (May be offered as a cross-career course with PHIL-4260.)

PHIL-8300. Topics in Gender and Sexuality
The course will focus on the philosophical implications of the impact gender and sexuality have on major epistemological, scientific, normative, and political problems. The specific focus of each year's class will be determined by the instructor. (May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8500. Topics in Mind or Knowledge
(May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8600. Movements and Figures in Argumentation Theory and Informal Logic
The course will focus on selected contemporary movements and figures in Argumentation Theory and Informal Logic. The movement and figure studied in any given year will be determined by the latest developments in the field. (May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8610. Problems in Argumentation and Informal Logic
(May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8710. Recent Continental Philosophy
A study of significant developments in recent Continental thought. The content of the course will vary according to the Instructor's interests and background. Traditions that might be examined include existential phenomenology, Marxism, deconstruction, and post-structuralism. (May be repeated for credit if content changes and with permission of the instructor.) (May be offered as a cross-career course with PHIL-4710.)

PHIL-8720. Analytic or Pragmatist Philosophy
Advanced study of themes and trends in Analytic or Pragmatist philosophy. Ordinarily, the topic will rotate on a yearly basis between Analytic Philosophy, in which logic, language, and scientific evidence play central roles and Pragmatist Philosophy which takes practice, in a broad sense of the term, to have a central role in most if not all philosophical issues. (May be repeated for credit if content changes and with permission of the instructor.) (May be offered as a cross-career course with PHIL-4720.)

PHIL-8770. Topics in Continental Philosophy
(May be repeated for credit if content changes and with permission of the instructor.)

PHIL-8800. to PHIL-8840. Special Topics
(May be repeated for credit if content changes and with permission of the instructor.)

GROUP B
The following course must be taken by all MA students:

PHIL-8900. Departmental Seminar: The History of Philosophy in Perspective
The aim of the seminar is to deepen students' sensitivity to the history of philosophy and help prepare them for the Master's examination in Philosophy. Each year a specific philosophical theme is traced through a number of key figures in the history of thought.

GROUP C
PHIL-8960. Major Paper

PHIL-8970. Thesis

POLITICAL SCIENCE

PROGRAMS

Master of Arts in Political Science (MA)

Admission Requirements
The normal requirement for admission to the one-year MA program is an honours degree or combined honours degree in Political Science, or an honours degree in a related discipline, such as International Relations, with a 77% average. Honours graduates in fields other than these will be considered on the basis of their academic background and standing. Those with less than a four-year degree, or with minor deficiencies, will be required to take additional courses, or to enter a two-year program.

Program Requirements
Completion of the MA degree will follow one of three routes:

A. Major Paper
1. Successful completion of POLS-8000 (Scope and Approaches to Political Science).
2. Successful completion of five further graduate classes (one of which may be taken outside of the department subject to the approval of the graduate chair).
3. Completion of a major paper. The major paper will be written under the direction of a committee normally composed of two Political Science faculty members. A successful oral defence of the major paper is required. The major paper is graded on a pass/fail basis.

B. Thesis
1. Successful completion of POLS-8000 Scope and Approaches to Political Science
2. Successful completion of three further graduate classes (one of which may be taken outside of the department subject to the approval of the graduate chair).
3. Completion of a thesis. The thesis will be written under the direction of a committee composed of two Political Science faculty members plus a member outside Political Science, but from within the University. A successful oral defence of the thesis is required.

C. Internship
1. Successful completion of POLS-8000 Scope and Approaches to Political Science
2. Successful completion of five further graduate classes (one of which may be taken outside of the department subject to the approval of the graduate chair).
3. Completion of a six-month internship (POLS-8950).
4. Completion of an internship paper. The internship paper will be written under the direction of a committee normally composed of two Political Science faculty members.
5. A successful oral defence and the internship.

After successful completion of three graduate courses, the graduate committee will request applications from students interested in participating in the internship stream (C).

The committee will select the successful students. The Political Science Graduate Committee will evaluate the performance of the remaining students and recommend completion of the degree by route (A) or (B).

Additional Information that pertains to all program streams:
All students must successfully complete POLS-8000 to complete the degree.
Any student securing a failing grade will normally be asked to withdraw from the program.

POLITICAL SCIENCE COURSES (POLS-)

All courses listed will not necessarily be offered in any given year. Courses are normally two hours a week.

POLS-8000. Scope and Approaches to Political Science
A review of the state of the discipline and a survey of approaches to research. This course is mandatory, as students will focus on their major paper/thesis research design.

POLS-8010. Selected Topics in Contemporary Political Theory
This course explores one or more themes in political theory through discussions and seminar presentations. While the focus is on political themes, the readings might be drawn from other disciplines, e.g., literature, psychology, religion, history, or sociology.

POLS-8020. International Relations Theory
A survey of recent literature on theories and methods in the study of international politics.
POLS-8210. Canadian Politics: Participation and Processes
Analysis of selected topics in Canadian politics. Topics may include parties, elections, voting behaviour, pressure groups, representation, new social movements, Canadian political theories, ideologies, and public opinion as measured through survey research and communication surveys. (May be offered as a cross-career course with POLS-4110).

POLS-8220. Canadian Public Policy
A review of the applicability of contemporary theories of public policy-making, policy evaluation, and policy delivery within the context of the Canadian political system. May include a focus on specific areas of public policy.

POLS-8230. Canadian Foreign Policy
An examination of selected issues in Canadian foreign policy, chosen for the relevance in driving the contemporary research agenda. Topics may include human security, Canadian defence policy, peacekeeping, and/or Canadian aid and development policy.

POLS-8320. The Third World in International Relations
An examination of the theoretical literature on such topics as the foreign policy of third world states, nonstate actors, structural dependence, North-South conflict, and regional integration.

POLS-8330. International Political Economy
Study of the major theoretical perspectives in international political economy as applied to such issues as multinational corporations, trade, and international development.

POLS-8340. International Security
An examination of selected topics in security. Examples of topics may include inter- and intra-state conflict, different approaches to conflict resolution, the utility of force, the causes of war, non-traditional approaches to security and/or detailed case studies of selected conflicts.

POLS-8350. Globalization, Poverty and Development
This course provides a foundation for understanding the fields of Globalization and Development Studies, with special emphasis on the problem of persistent poverty and inequality on a global scale, and the relation of this condition to global political economy, global justice, and global politics. With a focus on the role of the state and market, the course combines expertise and perspectives from the fields of Politics, International Political Economy, and Sociology of Development to provide an interdisciplinary learning environment. It covers a range of relevant topics including the definitions of globalization(s); the definition(s) and measurement of poverty; the analysis of the relationship between globalization, development and poverty; global politics and development, global justice and global ethics; and the 2007 global crisis and its relation to global poverty and development.

POLS-8360. Politics and Security in Russia and Eurasia
This course examines the politics of and security issues facing the Russian Federation, the five Central Asian Republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, and the Caucasian Republics of Georgia, Armenia and Azerbaijan. For the purposes of this course, the role and influence of Turkey, Iran, China and the United States on the politics and security of these Eurasian states will also be considered. The approach taken in this course is inter-disciplinary, drawing heavily from the fields of political science, history, and economics. The students will be introduced to political, economic and social issues affecting the region and taught how to research these issues through the lens of historical analysis and political economy.

POLS 8430. Collective Action and Contentious Politics
This course explores the conditions and processes shaping protests, riots, revolutions, and other forms of contentious politics. The course examines major theories about revolutions and social movements and considers competing explanations for the emergence of collective action. Particular attention is paid to the conditions under which people do or do not rebel and various aspects of the strategic interaction between social movements and states, and the determinants of movement outcomes. The students will read theoretical works and review several cases of revolutions and social movements in both democratic and nondemocratic state settings, thinking through parallels and differences among them.

POLS-8910. Selected Topics in Political Science
Topics of current interest selected by the Political Science faculty which may vary from year to year. (May be repeated for credit if offered as a different topic with the permission of the program coordinator.) (May be offered as a cross-career course with POLS-4450 or POLS-4610, if topic is the same.).

POLS-8920. Readings in an Approved Special Field
Intended for students with a special interest in and knowledge of areas not covered in sufficient depth by other courses. (To be taken only with the permission of the program coordinator.)

POLS-8950. Political Science MA Internship
The Political Science MA Internship places students in a full-time work placement relating to public policy and political science generally. Students will be placed with an organization for approximately six months in the summer and fall semesters. During this period, they will have the opportunity to continue their study of politics at a practical level, synthesizing the theory to practice. Interns will meet periodically during the internship in a class setting to evaluate the progress of their internships.

POLS-8960. Major Paper

POLS-8970. Thesis

PSYCHOLOGY

PROGRAMS

Doctor of Philosophy Degree
For the PhD degree, there are four approved fields. One is in Applied Social Psychology. The other three are clinical fields/tracks: Adult Clinical Psychology, Child Clinical Psychology, and Clinical Neuropsychology. The first phase of the doctoral program involves the completion of the master's degree in the first two years of the program. All applicants admitted to either Adult Clinical Psychology, Child Clinical Psychology, or Clinical Neuropsychology must first complete the master's degree in Clinical Psychology before progressing. Applicants to Applied Social Psychology may be admitted to the doctoral program with a master's degree from an outside institution. In the case that a student's previous master's degree is not from the field of Applied Social Psychology, the Applied Social Psychology faculty will determine what courses are needed to supplement their missing background preparation.

Admission Requirements
Applicants with a four-year Psychology Bachelor of Arts Honours or Bachelor of Science Honours degree (or equivalent degrees in adjacent areas, such as cognitive science, social behaviour, health science) will be considered for admission. Applicants will be assessed with respect to their grade point average (GPA); completion of at least one statistics course and at least one research methods course; completion of a research-based thesis or equivalent (e.g., an independent research project); three (3) letters of recommendation; a personal statement expressing interest in graduate training in the field, research interests, and research match; and a curriculum vitae/resumé. Possession of the minimum academic requirements does not ensure acceptance. Applications for admission to Clinical Psychology must be completed by November 15. Applications for admission to Applied Social Psychology Program must be completed by December 15.

Academic Advisor
Each student is assigned an academic advisor at the beginning of his, her, or their first year of graduate studies.

Doctoral Committee
Research undertaken as part of a doctoral program is directed by a doctoral committee. The membership of the doctoral committee must be approved first by the Head of the Department or Graduate Program Chair and then approved by the Executive Committee of the Faculty Council of Graduate Studies. When the student is deemed ready to undertake such research, he or she or they propose the name of a research advisor and, in consultation with the proposed advisor, the names of other members of the committee consisting of at least two other members of the Psychology Department and one extra-departmental member of faculty. For the defence of the dissertation, an external examiner will be selected by the doctoral committee, subject to the approval of the Department Head and the Dean of Graduate Studies. The external examiner is from outside of the University of Windsor and is nationally or internationally recognized as having expertise in psychology in which the candidate's research is carried out. The external examiner shall not participate in the direction of the research project but will appraise the dissertation and ordinarily will be present at the final oral examination.

Dissertation
A key requirement for the PhD degree in Psychology is the preparation and submission of a written doctoral dissertation document that embodies the results of an original investigation. The results so presented should constitute a significant and original contribution to knowledge. The oral defense of that doctoral dissertation research is another key requirement (see 'Final Examination' subsection below).

Examinations
In addition to examinations in courses, the student must meet the following requirements:

Comprehensive Examinations: After completion of all requirements at the master's level have been successfully completed, the student must pass a comprehensive examination usually undertaken in the first year of the PhD. The format for this requirement varies according to program.

Final Examination: Each candidate will, on the recommendation of his or her or their doctoral committee, submit to a final oral examination in defence of the dissertation, which will include the involvement of an external examiner.

Clinical Psychology (MA/PhD)

Students in Clinical Psychology are admitted to one of three tracks
1. Clinical Psychology (Adult)
2. Clinical Psychology (Child)
3. Clinical Neuropsychology

Master of Arts
To complete a Master of Arts degree in Clinical Psychology all students must successfully pass (receive a 70% or higher or a Pass for Pass/Fail) (All are required):
PSYC-8970. MA Thesis Research (until successfully defended and receive a Pass (P))
PSYC-8511. Statistics for Graduate Study in Psychology I
PSYC-8512. Statistics for Graduate Study in Psychology II
PSYC-8514. Research Methods in Clinical Psychology
PSYC-8581. Ethical and Professional Issues in Clinical Psychology

Personality and Individual Differences courses (All are required):
PSYC-8580 Psychopathology I
PSYC-8582 Psychopathology I
PSYC-8583 Clinical Assessment I
PSYC-8674 Introduction to Psychotherapy

At least **one,** two-semester **Therapy Course(s)** sequence:
PSYC-8675/ PSYC-8676. Child/Adolescent Clinical Interventions I and II
PSYC-8685/ PSYC-8686. Brief Psychodynamic Psychotherapy I and II
PSYC-8690/ PSYC-8691. Family Therapy I and II
PSYC-8692/PSYC- 8693. Cognitive Behavioural Therapy I and II
PSYC 8694/PSYC 8695. Integrative Psychotherapy I and II
PSYC 8696/PSYC 8697. Emotion Focused Therapy I and II

Students should take one (1) additional course within each of the **four (4) categories** below during the MA degree (any remaining courses must be completed during the PhD degree:

History of Psychology (pick one)
Must be completed if student has not already taken an equivalent course as part of a previously earned degree:
PSYC 4150. History and Systems of Psychology (or)
PSYC 8501. Historical and Philosophical Foundations of Psychology ()

Biological Bases of Behaviour:
PSYC-8503. Human Neuropsychology and Biological Bases of Behaviour ()

Cognitive Bases of Behavior (pick one):
PSYC 8505. Cognitive Bases of Behaviour
PSYC 8541. Cognitive Development
PSYC 8542. Emotional Development

Social Bases of Behaviour (pick one):
PSYC-8657. Issues in Cultural Diversity
PSYC-8550. Applied Social Psychology
PSYC-8588. Multicultural Issues in Clinical Practice

Complete at least 300 hours of clinical practicum experience, which can be obtained through the clinical hours accumulated within the following courses:

- At least one of the two-semester Therapy Course sequences
- Specialized assessment courses offered within each track
- PSYC-8701. Clinical Practicum MA-Level as part of a practicum placement and receive a Pass (P) in their final semester.

Additional Requirements/Specialized Courses Within Each Track for **Clinical Master of Arts Students**:

Students in the Adult Clinical track must take:
PSYC 8589. Advanced Adult Assessment
PSYC 8590. Adult Assessment Practicum

Students in the Child Clinical track must take:
PSYC-8652. Child Clinical Assessment I
PSYC-8653. Child and Adolescent Assessment Practicum

Students in the Child Clinical track may take:
PSYC-8540. Developmental Psychopathology (MA-level, if offered, otherwise PhD-level)
PSYC-8651. Survey of Child Psychotherapies (MA-level, if offered, otherwise PhD-level)
PSYC-8692. Cognitive Behavioural Therapy I (MA or PhD-level)
PSYC-8693. Cognitive Behavioural Therapy II (MA or PhD-level)
PSYC-8675. Child and Adolescent Clinical Interventions I (MA or PhD-level)
PSYC-8676. Child and Adolescent Clinical Interventions II (MA or PhD-level)

Students in the Clinical Neuropsychology track must take:
PSYC-8503. Human Neuropsychology and Biological Bases of Behaviour
PSYC-8529. Structure and Function of the Brain
PSYC-8692. Cognitive Behavioural Therapy I
PSYC-8693. Cognitive Behavioural Therapy II
PSYC-8702. Introductory Practicum in Clinical Neuropsychology (3 semesters)

Students in the Clinical Neuropsychology track must take:
PSYC-8529. Structure and Function of the Brain (MA-level, if offered, otherwise PhD-level)
PSYC-8642. Adult Clinical Neuropsychology: Theory Methods and Research (MA-level, if offered, otherwise PhD-level)

Take one (1) of the following courses at the MA or PhD-level:
PSYC-8644. Neurodevelopmental Disorders
PSYC-8645. Neuropsychological Aspects of Rehabilitation
PSYC-8648. Neuropsychology of Older Adults

[Students in Clinical Psychology (Adult)/Clinical Psychology (Child)/Clinical Neuropsychology are to complete these MA-level requirements with a minimum Grade Point Average (GPA) of 75% within two years.]

Doctor of Philosophy

After meeting the requirements above, all Clinical Psychology students who are pursuing a PhD in Clinical Psychology must successfully maintain a minimum cumulative GPA of 75% or higher and successfully pass (receive a 70% or higher or a Pass for Pass/Fail courses) the courses listed below:

1. **PSYC-9980 (Section 1) Doctoral Dissertation Research** (until successfully defended and receive a Pass (P))
2. **PSYC-9410 (Section 2) Comprehensive Examination** (must receive a Pass (P) within the first 4 semesters after registration as a PhD student (unless a delay has been approved by the department).
3. Complete at least **700 hours of clinical practicum experience**, which can be obtained through clinical hours accumulated within the following courses:
   - **Two-semester Therapy Course(s)** sequence(s)
   - **Specialized assessment courses** offered within each track
   - **PSYC-9020 (Section 01 or 02). Clinical Practicum** [As part of a practicum placement and receive a Pass (P) in the final semester of both.]
4. Preparing for **PSYC-9050 (Clinical Internship)** [register in the fall term during the year of internship application and receive a Pass (P)]
5. **PSYC-9060. Pre-Doctoral Clinical Internship**. [Continuously enrolled while completing their pre-doctoral clinical internship until receive a Pass (P) in their final semester.]

Additional Requirements/Specialized Courses Within Each Track for Clinical PhD Students

Adult Clinical
PSYC 8694/PSYC 8695. Integrative Psychotherapy I and II
PSYC 8715. Psychological Services and Research Center (PSRC) Advanced Psychotherapy Practicum (2 semesters)

Child Clinical
PSYC-8540. Developmental Psychopathology*
PSYC-8651. Survey of Child Psychotherapies*
PSYC-8692/PSYC-8693. Cognitive Behavioural Therapy I and II*
PSYC-8675/PSYC-8676. Child and Adolescent Clinical Interventions I and II*
**If not taken at the MA Level.*

Clinical Neuropsychology

PSYC-8529. Structure and Function of the Brain *
PSYC-8642. Adult Clinical Neuropsychology: Theory Methods and Research*
PSYC 8703. Advanced Practicum in Neuropsychology (2 semesters)

Take one (1) of the following courses:
PSYC 8644. Neurodevelopmental Disorders*
PSYC 8645. Neuropsychological Aspects of Rehabilitation *
PSYC 8648. Neuropsychology of Older Adults*
**If not taken at the MA Level.*

Applied Social Psychology (MA/PhD)

Master of Arts (Applied Social Psychology)
To complete a Master of Arts degree in Applied Social Psychology, students must successfully pass (receive a 70% or higher or a Pass for Pass/Fail courses) the following courses:

PSYC-8970. MA Thesis Research [until successfully defended and receive a Pass (P)]
PSYC 8511. Statistics for Graduate Study in Psychology I
PSYC 8512. Statistics for Graduate Study in Psychology II
PSYC 8560. Theory and Research in Social Psychology
PSYC 8577. Ethical Issues in Applied Psychology
PSYC 8550. Applied Social Psychology
PSYC 8566. Program Evaluation and Organizational Development
PSYC-8721. Applied Social Psychology Practicum (including 100 hours of practicum experience)
One (1) **Breadth course** at the 8000 level (See list below)

[Students are to complete these MA-level requirements with a minimum Grade Point Average (GPA) of 70% within two years.]

Doctor of Philosophy (Applied Social Psychology):
After meeting the MA requirements above, Applied Social Psychology students pursuing a PhD in Applied Social Psychology must successfully maintain a minimum cumulative GPA of 75% or higher and pass and take (9) additional courses (two research courses, two practice courses, and five classroom courses), including:

Two (2) Research Courses:
PSYC 9410, section 01. Comprehensive Examination (must receive a Pass (P) within the first 5 semesters after registration as a PhD student (unless a delay has been approved by the department)
PSYC 9980, Section 02. Doctoral Dissertation Research (until successfully defended and receive a Pass (P))

Two (2) Practice Courses (1000 hours total):
PSYC 9310. Applied Social Doctoral Internship I
PSYC 9320. Applied Social Doctoral Internship II

Four (4) Content Courses (including one (1) Methodology course):
PSYC-8501. Historical and Philosophical Foundations of Psychology
PSYC-8657. Issues in Cultural Diversity
PSYC-8516. Applied Psychological Measurement

Methodology course:
PSYC 8513. Advanced Multivariate Analysis **(or)**
PSYC-8517. Qualitative Methods

One (1) Additional Breadth Course:
PSYC 8575 Feminist Psychology and the Psychology of Women and Gender
PSYC 8578. Foundations of Positive Psychology: Flourishing in Interpersonal Contexts
PSYC 8610. Special Topics in Applied Social Psychology
PSYC 8660. Community Psychology
PSYC 8662. Health Psychology
PSYC 8665. Industrial/Organizational Psychology (or approved alternatives)

All Clinical Psychology and Applied Social Psychology MA/PhD Students

All graduate students in Psychology are required to comply with the most recent ethical principles, values, and standards of the Canadian Psychological Association and the American Psychological Association, and with the current standards for research with human participants adopted by the University of Windsor. Failure of a student to adhere to the principles, values, and standards defined above will constitute sufficient cause to warrant dismissal from the graduate program in Psychology.

Progress reports: All graduate students are required to demonstrate advancement in the program by completing an annual report to be submitted to the student's track/program coordinator. This report will describe the progress that the graduate student made over the previous year and outline the goals for the upcoming year. An Annual Evaluation of Student Progress will then be generated by the track/program coordinator to provide a review and evaluation of the status of the graduate student's progress in the program and recommendations for completion of the program in a timely manner. Failure of a student to complete this report annually may constitute sufficient cause to warrant dismissal from the graduate program in Psychology.

PSYCHOLOGY COURSES (PSYC-)

All courses listed will not necessarily be offered in any given year. Some courses are restricted to students in the Clinical Program.

PSYC-8070. Survey Data
Student will work in teams to develop questionnaires, gather data, and prepare them for analysis. Extensive reading will be required on sample design, questionnaire design, and survey administration. (2 lecture, 1 laboratory hour each week.) (May be offered as a cross-career course with SACR-8070)

PSYC-8080. Data Analysis
Students will explore their data and test hypotheses, drawing on methods from other graduate data analytic courses. Students will be required to write a final report which emphasizes communicating findings to non-specialists. (2 lecture, 1 laboratory hour each week.) (May be offered as a cross-career course with SACR-8080)

PSYC-8501. Historical and Philosophical Foundations of Psychology
The origin of modern psychology as a science and profession and the philosophy of science underlying psychology.

PSYC-8503. Human Neuropsychology and Biological Bases of Behaviour
Basic brain/behaviour relationships are introduced in the context of neuro-anatomical and neurotransmitter systems. Traditional theories of on brain function are reviewed, and include coverage of major neuropsychological domains (e.g., attention, memory, language, perception, sensory-motor, processing speed, executive function, emotion) and clinically relevant methods that evaluate central nervous system integrity (e.g., imaging, EEG, and neuropsychological evaluation). (3 hours a week.)

PSYC-8505. Cognitive Bases of Behaviour
Systems and methodologies in areas such as attention, perception, learning, memory and thinking. (3 hours a week.)

PSYC-8511. Statistics for Graduate Study in Psychology I
Overview of the general linear model (univariate case) covering statistical analyses used to analyze data from experiments as well as to analyze observational data. Topics will include analysis of variance including between subjects and repeated measures factorial designs, random effects, and various mixed designs. Both linear and logistic regression techniques will be covered including vector coding and continuous variable interactions, as well as other extensions. (3 lecture hours, 1 laboratory hour a week.)

PSYC-8512. Statistics for Graduate Study in Psychology II
Overview of the general linear model (multivariate case) including classical methods such as canonical correlation analysis, discriminant analysis, multivariate analysis of variance, and exploratory factor analysis. Other topics may include methods of addressing missing data, loglinear modeling, and confirmatory factor analysis. (Prerequisite: PSYC-8511.) (3 lecture hours, 1 laboratory hour a week.)

PSYC-8513. Advanced Multivariate Analysis
Topics covered: path analysis; structural equation modeling, including confirmatory analysis; and clustering methods. Other topics may include hierarchical linear modeling and latent growth modeling, multidimensional scaling, latent partition analysis and other related nonparametric techniques. (Prerequisite: PSYC-8512 or consent of instructor.) (3 hours a week.)

PSYC-8514. Research Methods in Clinical Psychology
Review of research values and issues in clinical psychology; survey and evaluation of common research designs and strategies in psychopathology, personality, and psychotherapy. (Prerequisite: PSYC-8511.) (3 hours a week.)

PSYC-8516. Applied Psychological Measurement
The basic principles of measurement and how they are applied in the construction and evaluation of surveys, tests, and scales will be covered. Also examined will be special problems characteristic of various approaches to measurement, such as the role of sampling in survey work. (3 hours a week.)

PSYC-8517. Qualitative Methods
This course examines the theory, methods, and inference of qualitative inquiry and includes practical application. Topics to be covered include the historical and theoretical roots of qualitative inquiry, ethics and a range of specific methods which may include interviewing, biography and case study, ethnography, grounded theory, archival and historical methods, and Q-Methodology. (3 seminar hours a week.)

PSYC-8519. Advanced Developmental Theory and Research Methods
Provides an overview of research designs and methodological issues in the context of contemporary child psychology research and developmental theories. Students conduct a literature review and design a research project in preparation for fulfilling the program's thesis and dissertation requirements.

PSYC-8529. Structure and Function of the Brain
A comprehensive introduction to the neuroanatomical basis of normal and abnormal human functioning, with coverage of the basic neuroanatomic structures and neurotransmitter systems of the central and peripheral nervous systems, including the sensory modalities, and proprioception), motor system, and autonomic nervous system, as well as the cortex, cranial nerves, cerebellum, basal ganglia, limbic structures, ventricles, meninges, and the vascular supply of the brain. The material covered in lectures will be reinforced by "hand-on" lab activities that will include the use of multimedia resources (e.g., videos) as well as analysis of real clinical case data and an introduction to the neurological examination and imaging procedures. (2 seminar hours and 2 laboratory hours per week; Prerequisite: PSYC-8503).

PSYC-8540. Developmental Psychopathology
Review and analysis of developmental theories and research describing normal and abnormal development across the life course.

PSYC-8541. Cognitive Development
Review and comparison of major theoretical positions in cognitive development and a consideration of research generated from these theories.

PSYC-8550. Applied Social Psychology
An in-depth exploration of the field of applied social psychology, its development and progress. The course will situate applied social psychological research within the broader field of social psychology. Students are also guided through the process of developing research proposals.

PSYC-8560. Theory and Research in Social Psychology
A review of research design and methodology in social psychology, in the context of social psychology theory. Students will develop proposals for research projects.

PSYC-8566. Program Evaluation and Organizational Development
An examination of theory, research, and analytical methods appropriate to the planning, design, implementation, and utilization of program evaluation in education, social, business, and other organizational settings. These issues will be combined with those of organizational development and workplace design, which encourage the engagement of workers/stakeholders, development of leaders, and promotion of a creative and inspiring workplace.

PSYC-8570. Comparative Cognition
Evidence of general and specialized cognitive processes in human and non-human organisms will be investigated. Topics to be covered include perception, attention, and memory, concept formation, ecological and evolutionary bases of cognitive processes. Current research on these and other topics will be reviewed and discussed in a seminar format. (Prerequisite: Any two of the following undergraduate courses or their equivalents from other universities: PSYC-3530, PSYC-3580 or PSYC-3350.) (Also offered as BIOL-8470) (May be offered as a cross-career course with PSYC-4570.)

PSYC-8575. Feminist Psychology and the Psychology of Women and Gender
This course uses the scholarship and careers of early and recent feminist psychologists to explore a selection of topics in feminist psychology and the psychology of women and gender. The impact of social and personal circumstances on women's career trajectories and research contributions is also explored within a feminist intersectional framework. (3 hours a week.)

PSYC-8577. Ethical Issues in Applied Psychology
This course will provide an overview of ethics and standards in psychological practice and research. Ethical issues in academic, clinical, community and organizational settings will be examined, and feminist and cross-cultural approaches to ethical issues will be considered. (Antirequisite: PSYC-8581.)

PSYC-8578. Foundations of Positive Psychology: Flourishing in Interpersonal Contexts
This course will provide students with foundational knowledge of positive psychology principles and interventions with an emphasis on applying this knowledge to interpersonal relationships in the two places where we spend the most time: at home and in the workplace. Some of the topics covered in this course include character strengths and virtues, positive emotions, social capital, high-quality connections, and being an agent of positive change, among others. The study of positive psychology in this context embraces the knowledge and practices that arise when research focuses on what enables people to flourish, as measured by thriving, engagement, health, growth, and creativity, all of which are essential for creating an optimal state of functioning.

PSYC-8580. Psychopathology
Seminar on issues, diagnostic categories, etiological perspectives, and research in psychopathology in adults, adolescents, and children; includes focus on risk assessment, cultural diversity, diagnostic interviewing and report-writing, and case presentations.

PSYC-8581. Ethical and Professional Issues in Clinical Psychology
Ethics and standards of psychological practice and research are reviewed. Legislation, privileged communication, confidentiality, informed consent, private practice, patient rights and sexism are among the topics discussed.

PSYC-8582. Clinical Assessment I
An introduction to clinical psychological assessment. Emphasis is on the cognitive, achievement, and adaptive functioning of children, adolescents, and adults. Topics and activities include basic psychometrics; interviewing; the construction, selection, evaluation, and use of ability tests; behavioural observations; case formulation; report writing; and an introduction to neuropsychological assessment. Attention is given to the assessment of individuals from cultural and linguistic minority backgrounds and to the assessment of those with disabilities. Students practice the administration, scoring, and interpretation of tests; practice interviewing; develop basic report writing skills; and conduct at least one cognitive assessment of an adult and a child.

PSYC-8583. Clinical Assessment II
Development of knowledge and skills in the assessment of psychopathology and personality in children, adolescents, and adults; evaluation of the clinical utility and psychometric properties of major personality instruments. The focus is on objective personality assessment, with an introduction to projective techniques. Students build on the skills developed in PSYC-8582; practice the administration, scoring, and interpretation of tests, case formulation, and report writing; and conduct at least one clinical evaluation. Attention is given to non-normative aspects of personality and psychopathology assessment of individuals from cultural and linguistic minority backgrounds and to assessment of those with disabilities. (Prerequisite: PSYC-8582.) (3 seminar, 3 laboratory/practicum hours a week.)

PSYC-8588. Multicultural Issues in Clinical Practice
An overview of the field of multicultural counseling and psychotherapy and, to a lesser extent, the field of cross-cultural psychology. The course surveys multicultural research, theories, practices, ethical issues, and assessment, and aims to facilitate students' multicultural competency in terms of cultural awareness, knowledge, and skills. A strong emphasis is placed on students' self-examination of personal cultural values and identities, and the impact these variables might have on their clinical work with clients or patients.

PSYC-8589. Advanced Adult Assessment
Students work with one or two adult clients to apply basic assessment skills acquired in preceding courses, to evaluate a wide range of cognitive, emotional, personality and interpersonal functions. The goal is to arrive at a comprehensive description of the person being assessed that results in meaningful clinical recommendations. Assessment strategies frequently employed in the field of clinical psychology will be practiced, and students will acquire skill with additional assessment instruments as determined by client needs. Students with further their skills in interviewing, report writing, clinical formulation, diagnosis, and making recommendations and referrals appropriate to the needs of clients. Client cultural and linguistic differences are considered. This course includes a peer supervision training component whereby students learn to provide constructive feedback to their peers. (Prerequisite: PSYC-8583)

PSYC-8590. Adult Assessment Practicum
In this practicum, graduate students in the adult clinical track of the clinical program complete psychoeducational and psychodiagnostics assessments of community members who seek assessment services at the Psychological Services and Research Centre on-campus under the supervision of a Registered Clinical Psychologist. This is a continuation of learning from PSYC-8589 as well as PSYC-8582 and PSYC-8583. (Prerequisite PSYC-8589).

PSYC-8591. Advanced Adult Assessment Fall and Winter Practicum
In this practicum during the regular academic year, graduate students in the clinical program complete psychoeducational and psychodiagnostics assessments of community members who seek assessment services at the Psychological Services and Research Centre on-campus under the supervision of a

Registered Clinical Psychologist. (Prerequisite: PSYC-8589.) (Adult clinical students will receive registration priority.) (This is an experiential learning course.)

PSYC-8604. Special Projects in Psychological Research
Provides the opportunity for a student to work on an independent research project under the supervision of a faculty member. Requires consent of instructor and Graduate Program Chair. May be taken for a maximum of two terms.

PSYC-8606. Special Topics in Psychology
Seminar format provides an opportunity to study in an area not covered in sufficient depth by other courses. May be taken more than once if offered by a different instructor. (3 seminar hours a week.)

PSYC-8610 Special Topics in Applied Social Psychology
Seminar format provides an opportunity to study in an area of Applied Social Psychology not covered in sufficient depth by other courses. May be taken more than once if offered by a different instructor. (3 seminar hours a week.)

PSYC-8630. Professional and Practice Issues in Clinical Psychology
A series of seminars/workshops covering various topics, which may include but are not limited to, professional development (e.g., self-assessment of competencies, communicating a diagnosis, risk assessment, the mental health system in Ontario, strategies for providing tactful assessment feedback), career planning (e.g., professional registration, post-doctoral training opportunities, private practice), and provision of services in special settings/groups (child custody, forensic, medical/health, geriatric, LGBTQ, indigenous, immigrant/refugee). (3 hours a week.)

PSYC-8640. Child Clinical Neuropsychology: Theory Methods and Research
This course includes a survey of the literature on brain-behaviour relationships, including the effect of brain dysfunction on perception, learning, memory, language and thinking as present in children/adolescents receiving clinical neuropsychology services. Students will receive training in the administration, scoring, and interpretation of neuropsychological tests currently used in practice with children and adolescents. This course includes seminars and required lab sessions. (Prerequisite PSYC-8503; non-clinical neuropsychology students must have instructor permission to enrol.)

PSYC-8642. Adult Clinical Neuropsychology: Theory Methods and Research
This course includes a survey of the literature on brain-behaviour relationships in adults. Topics emphasized include: the effect of brain dysfunction on perception, learning, and thinking, memory disorders, and personality disorders associated with cerebral dysfunction in adulthood. Students will receive training in the administration, scoring, and interpretation of neuropsychological tests, including strategies and techniques of assessment, rationales underlying the use of various measures, modes of interpretation, and approaches to intervention. This course includes seminars and required lab sessions. (Prerequisite: PSYC-8503; non-clinical neuropsychology students must have instructor permission to enrol.)

PSYC-8644. Neurodevelopmental Disorders
An examination of the theories, research, and practice related to the neuropsychological and biological correlates of neurodevelopmental disorders. Each semester a particular disorder (e.g., ADHD) will selected as a prototype to consider assessment, diagnosis, and treatment of neurodevelopmental disorders. (Prerequisites: PSYC-8503 and PSYC-8583, or consent of instructor.) (3 seminar hours per week.

PSYC-8645. Neuropsychological Aspects of Rehabilitation

A study of the literature and the methods currently employed in the treatment of brain-injured adults. Topics to be stressed include epidemiology and societal impact, pathophysiology, clinical presentation and both the theories and practices of rehabilitation. (3 hours a week.)

PSYC-8648. Neuropsychology of Older Adults
A survey of the literature dealing with brain-behaviour relationships across the older adult life span. Emphasis is given to the understanding and assessment of normal and dysfunctional aspects of cognitive and affective development in older adults. (Consent of instructor.) (3 hours a week.)

PSYC-8651. Survey of Child Psychotherapies
Introduction to psychotherapy with children with an emphasis on fundamental principles and empirical foundations of effective psychotherapy. Several treatment approaches are studied.

PSYC-8652. Child Clinical Assessment
Advanced training in selection, evaluation, and use of tests designed for the assessment of children's abilities, personality, and behaviour. Practicum in administration, interpretation, and communication of results of comprehensive test batteries.

PSYC-8653. Child and Adolescent Assessment Practicum
In this practicum, graduate students in the child clinical track of the clinical program complete psychoeducational and psychodiagnostics assessments of children and adolescents from the surrounding community. Typically, parents are seeking assessment services on behalf of the child. The practicum is housed at the Psychological Services and Research Centre on-campus under the supervision of a Registered Clinical Psychologist. This is a continuation of learning from PSYC 8652 as well as PSYC 8582 and 8583. (Prerequisite: PSYC 8652).

PSYC-8657. Issues in Cultural Diversity
An examination of issues associated with the negotiation of individual and intergroup relations in a culturally pluralist society, from an explicitly intercultural psychological perspective that focuses primarily upon the social processes occurring when members of different cultural groups interact with one another. Groups considered include, but are not restricted to, those based on ethnicity, gender, and class. Issues to be covered include the search for universals of social behaviour, the determinants, characteristics, and consequences of acculturative stress, and cultural value differences in the definition of self, inter-personal, and inter-group relations.

PSYC-8662. Health Psychology
An overview of health psychology, with emphasis on contributions made by psychology to the areas of health promotion, prevention and treatment of illness, modification of unhealthy behaviours, and improvement of health delivery. Application of the biopsychosocial model to health-related research and practice will be examined.

PSYC-8665. Industrial/Organizational Psychology
An examination of theory, research, and practice in the area of Industrial/Organizational Psychology. Industrial topics include measurement theory, job analysis, criterion development and other areas of personnel decision making. Organizational topics cover leadership, work motivation, team development, organizational development, and other areas of organizational functioning.

PSYC-8674. Introduction to Psychotherapy
An overview of historical and contemporary models of psychotherapy, common therapeutic factors, and therapy outcome research. Development of basic therapeutic relationship skills and empathic responding through role-playing and other class activities.

PSYC -8710. Practicum in Peer Supervision
In this practicum, advanced graduate students will engage in clinical supervision of more junior peers while receiving supervision from a registered psychologist. These practicum experiences will be embedded in established assessment and intervention courses as well as internal practica within the Department of Psychology.

THERAPY COURSES (PSYC-8675 through PSYC-8697)

Therapy course sequences consist of courses numbered PSYC-8675 through PSYC-8697 as listed below. General prerequisites for ALL two-term therapy course sequences are enrollment in the Clinical Psychology Program; PSYC-8674, and the consent of the instructor and Director of Clinical Training. PSYC 8581 is a prerequisite or co-requisite for all therapy courses. Additional prerequisites for individual therapy courses are indicated in the course description.

Therapy course sequences are taught over two terms. Seminars involve readings, discussion, and presentations on the theory, relevant research, techniques, and processes that are specific to the therapeutic approach under consideration. Practica involve supervised experience appropriate to the therapeutic modality. Students include practicum hours obtained through therapy courses in the total number of practicum hours reported on internship applications.

At least three different therapy course sequences will be offered in each academic year, but offerings will vary from year to year depending upon demand and the availability of qualified instructors.

PSYC-8675. Child/Adolescent Clinical Interventions I
Examination of the theory, research, and practice of clinical interventions with children, adolescents and families with an emphasis on fundamental principles and empirical foundations of effective psychotherapy. Issues relevant to the practice of psychotherapy with different groups will be discussed. (Space is limited; preference will be given to students in the Child Clinical Track and more advanced students in the Clinical Neuropsychology track who have previously indicated that they intend to apply to child-focused internship sites (3 seminar hours a week, plus practicum.)

PSYC-8676. Child/Adolescent Clinical Interventions II
Seminar and supervised practice in clinical interventions with children, adolescents and families. (Prerequisite: PSYC-8675.) (3 seminar hours a week, plus practicum.)

PSYC-8677. Advanced Child/Adolescent Clinical Interventions I
This advanced course focuses on training in theory and practice of clinical interventions with children, adolescents and families. Emphasis is placed on advanced intervention skills applied to child and adolescent populations and problems. Primary focus of training will be in individual and co-therapy with child and adolescent groups. Students may also be trained in parent-child interventions and co-therapy in group interventions with parents. Students explore their own psychological functioning as well as the therapeutic process and thus have the opportunity for personal as well as professional growth. Space is limited; preference will be given to students in the Child Clinical Track. (Prerequisites: completion of MA requirements; PSYC-8675 and PSYC-8676) (3 seminar hours a week, plus practicum.)

PSYC-8678. Advanced Child/Adolescent Clinical Interventions II
Advanced seminar and supervised practice in clinical interventions with children, adolescents and families. (Prerequisite: PSYC-8677.) (3 seminar hours a week, plus practicum.)

PSYC-8683. Special Topics in Therapy I
This course provides an introduction to theory, research and therapeutic techniques related to a specific approach to intervention not covered by other therapy course offered in the Clinical Psychology Program (e.g., marital/couples, group, systemic, crisis intervention, interpersonal, existential, dialectical behaviour therapy). Topics will vary from year to year. (Prerequisite or co-requisite: PSYC-8581.) (3 seminar hours a week, plus practicum.) (May be repeated for credit if therapy modality is different.)

PSYC-8684. Special Topics in Therapy II
Supervised practical experience in applying the specific therapeutic theory and techniques introduced in the linked PSYC-8683 offering. (Prerequisite: PSYC-8683.) (3 seminar hours a week, plus practicum.) (May be repeated for credit if therapy modality is different.)

PSYC-8685 Brief Psychodynamic Psychotherapy I
This course focuses on the acquisition of knowledge and skills necessary to practice brief psychodynamic therapy. Students will be instructed in a brief psychodynamic psychotherapy (BPP) method through readings, didactic training, and role playing. The chosen relational approach is to be specified by the instructor at the time of course selection by students. After this didactic training period, students will engage in the practicum portion of this course with at least one client with whom they will practice the BPP method taught in this course. Weekly supervision will be provided to guide students in the application of BPP to their therapeutic work. (Prerequisites: PSYC-8674; PSYC-8581; consent of instructor and Director of Clinical Training.) (3 seminar hours a week; seminar and supervision plus practicum).

PSYC-8686. Brief Psychodynamic Psychotherapy II
Students continue supervised practice with at least one client according to the BPP approach selected for PSYC-8685. Concurrently, students learn to conduct interpretive work through readings, didactic instruction, and role playing. In the practicum portion of this course, students learn to conduct interpretive work with their clients within BPP.(3 seminar hours a week, plus practicum.)

PSYC-8690. Family Therapy I
This course covers the background theory, research, and therapeutic techniques of the major approaches to family therapy. Issues relevant to the practice of psychotherapy with different groups will be discussed.
Preference will be given to students in the Child Clinical track. Prerequisite: One previous therapy course sequence and one or more of the following: PSYC-8540, 8651 and/or 8675/8676.

PSYC-8691. Family Therapy II
Seminar and supervised practice in family therapy. (Prerequisite: PSYC-8690). (3 seminar hours a week, plus practicum).

PSYC-8692. Cognitive Behavioural Therapy I
This is the first course in a two-course sequence that is designed to provide a reasonably comprehensive and practical overview of Cognitive-Behavioural Therapy (CBT). The focus in this course is on understanding the basic theoretical and applied principles of CBT and on developing intake/evaluation, case conceptualization, and basic CBT intervention skills. Supervised practicum will begin at the end of the semester based upon the availability of appropriate referrals. During the practicum, student therapists provide therapy and attend weekly supervision meetings during which recorded sessions are reviewed and discussed. (3 seminar hours a week, plus practicum.)

PSYC-8693. Cognitive Behavioural Therapy II

This course plus practicum focuses on a tailored application of CBT interventions to a range of common clinical problems, how CBT may be adapted and modified to meet the needs of diverse populations, and on reviewing empirical support for the use of CBT. Issues related to therapist training, growth, development, and supervision are addressed. The supervised practicum that began in the first semester will continue during this semester. (Prerequisite: PSYC 8692.) (3 seminar hours a week, plus practicum.)

PSYC-8694. Integrative Psychotherapy I
This course is designed to facilitate the student therapist's development of a personal framework for integrating theoretical concepts and therapeutic interventions across two or more psychotherapy approaches (e.g., CBT, EFT, Psychodynamic, Humanistic/Experiential) in the service of providing more individualized treatments to enhance client outcomes. Students will continue to explore personal development relevant to professional practice. Students see at least one therapy client under individual supervision. Priority is given to students in the Adult Clinical Track. (Co-requisite: PSYC-8715.) (6 hours a week, combined seminar and practicum.)

PSYC-8695. Integrative Psychotherapy II
Further development of an integrative psychotherapy framework with an emphasis on case conceptualization as applied to diverse syndromes, situations, and populations. The focus is on the therapist's ability to understand the client's situation and symptoms and to select appropriate interventions based on the therapist's own articulation of integrative psychotherapy. Students will continue to explore personal development relevant to professional practice. Students see at least one therapy client under individual supervision. Priority is given to students in the Adult Clinical Track. (Co-requisite: PSYC-8715.) (6 hours a week, combined seminar and practicum.)

PSYC-8696. Emotion Focused Therapy I
EFT is based on current emotion theory and experiential therapy theory and research emphasizing the central role of emotion in functioning and therapeutic change. This course covers the theory, research, and therapeutic techniques used in this treatment model. Students will participate in class discussions, role play exercises, and view videotapes of expert therapists. Supervised practica will begin the end of the first semester. (3 seminar hours a week, plus practicum.)

PSYC-8697 Emotion Focused Therapy II
EFT is based on current emotion theory and experiential therapy theory and research emphasizing the central role of emotion in functioning and therapeutic change. This course covers the theory, research, and therapeutic techniques used in this treatment model. Students will participate in class discussions, role play exercises, and view videotapes of expert therapists. (Prerequisite PSYC-8696.) (3 seminar hours a week, plus practicum.)

PSYC-8701. Clinical Practicum: MA Level
Supervised experience in an approved clinical setting with a focus on the development of basic clinical skills in preparation for practice and/or research, including skills related to interviewing, use of clinical assessment instruments, case formulation, report writing, and intervention. Prior to completion of MA requirements, students register for this course for each semester in which they attend a practicum placement.

PSYC-8702. Introductory Practicum in Clinical Neuropsychology
Students will work with mock clients as they develop their neuropsychological assessment skills; and observe more advanced students conducting neuropsychological assessments. After demonstrating basic mastery of test administration and clinical interpersonal skills, students will administer, score, and interpret neuropsychological measures under supervision. This course will be largely practice-based with group supervision as well as limited didactic instruction and will be co-taught with PSYC-8703 (Intensive

practicum in clinical neuropsychology). Students register for this course for three full terms (Inter/Summer, Fall, Winter). (Prerequisite: PSYC-8583 and consent of instructor). (Graded on a pass/fail basis.)

PSYC-8703. Advanced Practicum in Neuropsychology
Students will continue to work with clinical supervisors to design test batteries, conduct interviews and assessments, provide diagnoses, and communicate results of assessment and recommendations for intervention to clients in this year-long course. In this second year of clinical practice, students will also serve as lead assessors with assistance from more junior students. This course will be largely practice-based with group and individual supervision as well as limited didactic instruction and will be co-taught with PSYC-8702 (Introductory Practicum in Clinical Neuropsychology). Students register for this course for three full terms (Inter/Summer, Fall, Winter). (Prerequisites: PSYC-8702.) (Graded on a Pass/Fail basis.)

PSYC-8707. Supervision, Consultation, and Interdisciplinary Relationships
This course explores models, ethics, and issues related to supervision and consultation in the practice of clinical psychology, and the benefits and challenges of working with professionals in other disciplines. It includes didactic, discussion, and experiential components. (Prerequisites: completion of MA requirements; consent of instructor and Director of Clinical Training.) (3 hours a week.) (Graded on a Pass/Fail basis.)

PSYC-8715. Psychological Services and Research Center Advanced Psychotherapy Practicum
This practicum focuses on training in psychotherapy theory and practice. Emphasis is placed on advanced psychotherapeutic skills applied to various client populations and problems. Training in individual psychotherapy is the primary focus. Students may also be trained in crisis intervention and in co-therapy with families, groups, or couples. Students will continue to explore personal development relevant to professional practice. Priority is given to students in the Adult Clinical Track. (Prerequisites: completion of MA requirements; completion of two psychotherapy course sequences; enrolment in Clinical Psychology Program and consent of Director of Clinical Training.) (Co-requisites: PSYC-8694 and PSYC-8695.) (14 practicum hours a week.)

PSYC-8721. Applied Social Psychology Practicum
Problem solving in work settings, applying methods of community psychology, organizational psychology, and other fields of applied psychology. Students consult and work directly with a group or organization on a project selected for value to the organization and to the student.

PSYC-8794. Directed Study Major Project I
Under the guidance of the instructor, the candidate will engage in research on a discipline relevant issue, using existing data set(s), leading to the production of a final project which entails empirically grounded policy suggestions. Students will select a Project Committee, review literature, and develop research question and identify data set(s). (Cross listed with SACR-8794)

PSYC-8795. Directed Study Major Project II
In the Summer Semester, operationalize concepts, recode variables, analyze data, write report and suggest policies. The final project will show evidence of methodological skills, knowledge of the relevant substantive area, and ability to define policy implications based on analyzed data. (Cross listed with SACR-8795)

PSYC-8970. MA Thesis Research

PSYC-9020. Clinical Practicum: PhD Level
Supervised experience in an approved clinical setting with a focus on the development of basic clinical skills in preparation for practice and/or research. Students register for this course for each semester in which they attend a practicum placement. (Prerequisite: completion of MA requirements and consent of the Director of Clinical Training.)

PSYC-9050. Preparing for Clinical Internships
This one-term course is intended to assist students with their development and submission of written applications and preparation for the interviews that occur in the process of obtaining required one-year pre-doctoral internships in CPA- or APA-accredited clinical settings. (Prerequisites: completion of all required courses and practica, acceptance of dissertation proposal by the preceding June 15, consent of Director of Clinical Training.) (1.5 hours per week, graded P/F)

PSYC-9060. Predoctoral Clinical Internship
A one-year, full-time (or two-year, half-time) internship/residency in a CPA- or APA-accredited clinical setting. (Prerequisites: completion of all doctoral requirements except for PSYC-9980; acceptance of dissertation proposal at time of application for internship; consent of Director of Clinical Training.)

PSYC-9310. Applied Social Doctoral Internship I
(500 hours of supervised internship.)

PSYC-9320. Applied Social Doctoral Internship II
(500 hours of supervised internship.)

PSYC-9410. Comprehensive Examination
Independent study for and completion of the written Comprehensive Examination. Students in the Applied Social Psychology program register in PSYC-9410-1 for a maximum of five consecutive terms. Students in Clinical Psychology programs register in PSYC-9410-2 for a maximum of three consecutive terms. (Prerequisite: completion of MA requirements.)

PSYC-9980. Doctoral Dissertation Research

SCHOOL OF CREATIVE ARTS

PROGRAMS

Master of Fine Arts in Visual Arts (MFA)

As of Fall 2024, there are no new admissions to this program.

The program provides two years of advanced education and creative development in the student's chosen areas of research. The program emphasizes studio production and the exploration of ideas and technical skills within a critical framework. Areas of research within the MFA program are Painting/Drawing, Sculpture and Installation, Printmaking, and Integrated Media (Video, Sound, Photography and Digital Arts).

Admission Requirements
1. For admission to the Visual Arts Master of Fine Arts program, applicants must satisfy the following requirements:
(a)portfolio submission: submit a pdf with links for web or digital download to twenty images/video/audio pieces of recent work for evaluation by the departmental graduate acceptance committee;
(b)have attained at least a 75% cumulative average;
(c) have six courses in art history/visual culture;
(d) present transcripts of all university and/or college-level work;
(e) three letters of recommendation;
(f) provide a clear statement of interest;
(g) minimum language scores for international students: TOEFL - 100; IELTS – 7.0; Pearson – 68

2. Normally, successful applicants will have an Honours B.F.A. in Visual Arts, or or a cognate discipline. Students who do not meet this requirement may be admitted to the Faculty of Graduate Studies in a qualifying (M1) program.

Degree Requirements
1. Ten courses are required:
(a) four courses in Studio Practice (VSAR-8610, VSAR-8620, VSAR-8630, VSAR-8640);
(b) MACS-8600: Contemporary Issues;
(c) MACS-8000: Directed Individual Studies;
(d) Graduate Seminars (VSAR-8596, VSAR-8597, VSAR-8598, VSAR-8599);
(e) During their first year, students must participate in a first year MFA. group exhibition. Additionally, students will participate in three end of semester reviews to evaluate studio production in semesters 1, 2, and 3.

2. Thesis (VSAR-8970): The thesis will consist of an exhibition of a body of original creative works within the candidate's area of research, and an accompanying written support document. The thesis will be planned with and executed under the direction of the candidate's principal faculty advisor. This final exhibition will be regarded as the equivalent of the scholarly thesis of an academic discipline.

SCHOOL OF CREATIVE ARTS COURSES

VSAR-8660. Studio Production II
This course explores experimental and innovative approaches to media arts. The focus of the course is on experimental video, animation, video installation art, interactive art, audio/sound art, audio responsive installation, multimedia performance, and any fusion thereof. Time-based media arts environments may include sound, video, images, text and/or alternate physical feedback as triggered through interaction. (Lab fees may apply.)

VSAR-8596.Graduate Seminar 1
The seminar addresses art methodologies in the creative research, the development of critical vocabulary and interpretations in the context of contemporary art making as well as some pedagogical concepts through lectures, group discussions, studio visits, visiting scholars and artists. The seminar provides a forum for peer critique and critical discussion on contemporary concepts related to the students' artistic research. (Open to MFA. students only.)

VSAR-8597.Graduate Seminar 2
The seminar addresses art methodologies in the creative research, the development of critical vocabulary and interpretations in the context of contemporary art making as well as some pedagogical concepts through lectures, group discussions, studio visits, visiting scholars and artists. The seminar provides a forum for peer critique and critical discussion on contemporary concepts related to the students' artistic research. (Prerequisite: VSAR-8596.) (Open to MFA. students only.)

VSAR-8598.Graduate Seminar 3
The seminar addresses art methodologies in the creative research, the development of critical vocabulary and interpretations in the context of contemporary art making as well as some pedagogical concepts through lectures, group discussions, studio visits, visiting scholars and artists. The seminar provides a forum for peer critique and critical discussion on contemporary concepts related to the students' artistic research. (Prerequisite: VSAR-8597.) (Open to MFA students only.)

VSAR-8599.Graduate Seminar 4
The seminar addresses art methodologies in the creative research, the development of critical vocabulary and interpretations in the context of contemporary art making as well as some pedagogical concepts through lectures, group discussions, studio visits, visiting scholars and artists. The seminar provides a forum for peer critique and critical discussion on contemporary concepts related to the students' artistic research. (Prerequisite: VSAR-8598.) (Open to MFA. students only.)

VSAR-8000. Special Project
Directed individual artist project outside the Student's area of research. (May be repeated for credit.) (Has to be approved by the Graduate Committee and the Program Coordinator.)

VSAR-8970. Thesis

SOCIAL WORK

PROGRAMS

PhD in Social Work

Admission Requirements
1. Completed a Social Work degree from an accredited university (BSW or MSW)
2. A minimum 80% (A- average) in the most recent graduate degree
3. A statement of interest
4. Research proposal
5. Practice and educational experience.
6. Curriculum vitae
7. Sole or co-authored sample of professional or academic writing.
8. Three letters of reference.
9. Transcripts

Degree Requirements: 7 doctoral courses and 1 doctoral seminar course

Fall
SWRK-9720. Epistemology and Philosophy of Science in Social Work
SWRK-9740. Qualitative Methods in Social Work Research
SWRK-9743. Quantitative Methods in Social Work Research

Winter
SWRK-9730. History and Theory in Social Work
SWRK-9741. Qualitative Data Analysis
SWRK-9744. Quantitative Data Analysis

Summer/Fall
SWRK-9980. Dissertation Research

Winter
SWRK-9795. Dissertation Seminar

Comprehensive Proposal and Paper
The comprehensive proposal must be approved by the student's supervisor. The comprehensive paper must be approved by the student's supervisor and one other faculty member in the School of Social Work who typically will become the second reader on the doctoral dissertation committee.

The supervisory committee must include at least three, and no more than five, faculty members who are appointed to the University of Windsor Faculty of Graduate Studies. This includes the supervisor, two department readers, one outside department reader who is within the University of Windsor. The dissertation supervisor, program reader 1 and program reader 2 must have Graduate Faculty designation status.

Progress reports
All students are required to demonstrate advancement in the program by completing an annual report to be submitted to the student's supervisor. This report will describe the accomplishments made over the previous year and outline the goals for the upcoming year.

Dissertation Evaluation Procedures
Consistent with the Graduate Studies regulations, the student must successfully defend the thesis at an oral examination presided over by an Examination Committee. The committee consists of at least six members: the supervisory committee; an external examiner outside the University of Windsor; and a representative of the Dean as approved by the Faculty of Graduate Studies.

For more information, contact the School of Social Work (http://www.uwindsor.ca/socialwork/403/phd-program).

Minimum Course Grade Policy
Courses in which a grade of 70% or higher is received will be accepted for graduate credit.

Students must maintain a cumulative grade point average (cGPA) of at least 70% in each semester in which they are enrolled. A student who earns a course grade in the range 60-69% in one Course, or if their cGPA falls below 70%, will be placed on academic probation. A student will remain on academic probation for one subsequent semester by the end of which they must have raised their cGPA to at least 70%, or they will be required to withdraw. A student may also be required to withdraw from the program if they receive more than two course grades in the range of 60-69%, or one course grade below 60%. Please note, as per University policy, students may be allowed to retain for credit up to two courses in which they received a grade of 60-69%.

Master of Social Work (MSW)

Admission Requirements
To be considered for admission to any MSW programs, the School of Social Work requires applicants to have a minimum average of 73% or equivalent. Applicants also must have relevant work, volunteer, or practica experience; excellent reference letters; a strong personal statement; and evidence of successful completion of one undergraduate course in statistics and one in research methods both of which must be related to social sciences. If you have not completed one or both of the required courses, the coordinator of the program can provide you with options for accomplishing these if required prior to admission.

Regular Track Full-time MSW
This program is open to students with an Honours degree in a related discipline and takes five (5) consecutive semesters (approximately two years) to complete. It includes a required Foundation Practicum in the first year of study and the completion of an Advanced Practice Internship (API) in the second year of study. The Foundation Practicum and the API may involve travel and/or weekend hours, and students are responsible for transportation to and from their field placement or internship location.

Students are required to complete a total of eleven (11) courses, one of which is a practicum in the Foundation year (first year of study): SWRK-8503, SWRK-8504, SWRK-8521, SWRK-8531, SWRK-8532, SWRK-8533, SWRK-8534, SWRK-8547, SWRK-8550, SWRK-8570, and SWRK-8571 (Foundation Year Practicum 6.0 credit hours). Students are required to complete a total of seven (7) courses, one of which is an internship in the second year of study: SWRK-8610, SWRK-8611, SWRK-8630 or SWRK-8631, SWRK-8622, SWRK-8640, SWRK-8680, and SWRK-8681 (Advanced Practice Internship 6.0 credit hours).

Advanced Standing Master of Social Work *
*This program is available to students with a Bachelor of Social Work (BSW) and starts in May of each year in order for students to graduate at June Convocation.

This program takes three (3) consecutive semesters (one year) to complete and includes the completion of an Advanced Practice Internship (API). The API may involve travel and/or weekend hours, and students are responsible for transportation to and from their internship location. Students are required to complete a total of nine (9) courses, one of which is an Internship: SWRK-8521, SWRK-8547, SWRK-8610, SWRK-8611, SWRK-8630 or SWRK-8631, SWRK-8622, SWRK-8640, SWRK-8680, and SWRK-8681 (Advanced Practice Internship 6.0 credit hours).

Minimum Course Grade Policy
Students must maintain a cumulative grade point average (cGPA) of at least 70% in each semester in which they are enrolled. A student who earns a course grade in the range 60-69% in one Course, or if their cGPA falls below 70%, will be placed on academic probation. A student will remain on academic probation for one subsequent semester by the end of which they must have raised their cGPA to at least 70%, or they will be required to withdraw. A student may also be required to withdraw from the program if they receive more than two course grades in the range of 60-69%, or one course grade below 60%. Please note, as per University policy, students may be allowed to retain for credit up to two courses in which they received a grade of 60-69%.

Master of Social Work for Working Professionals (MSW) (0nline)

The MSW for working professionals' program is taught in a continuous online synchronous format.

Regular Track Full-time MSW for Working Professionals

This program is available to students who are working in a social service delivery position and who hold an Honours degree in a related discipline. This program takes eight (8) consecutive semesters (32 months) to complete and includes a required Foundation Practicum and an Advanced Practice Internship (API). The Foundation Practicum and the API may involve travel and/or weekend hours, and students are responsible for transportation to and from their field placement or internship location.

Students are required to complete a total of eleven (11) courses, one of which is a practicum in the Foundation level of study: SWRK-8503, SWRK-8504, SWRK-8521, SWRK-8531, SWRK-8532, SWRK-8533, SWRK-8534, SWRK-8547, SWRK-8550, SWRK-8570, and SWRK-8571 (Foundation Practicum – 6.0 credit hours). Students are required to complete a total of nine (9) courses, one of which is an internship in the Advanced level of study: SWRK-8610, SWRK-8611, SWRK-8630 or SWRK-8631, SWRK-8622, SWRK-8640, SWRK-8680, and SWRK-8681 (Advanced Practice Internship – 6.0 credit hours).

Advanced Standing Full-time MSW for Working Professionals
This program is available to students who are working in a social service delivery position and who have completed a BSW degree from a Canadian Association for Social Work Education or Council on Social Work Education accredited program. The program takes four consecutive semesters (16 months) to complete and includes the completion of an Advanced Practice Internship (API). The API may involve travel and/or weekend hours, and students are responsible for transportation to and from their internship location.

Students are required to complete a total of nine (9) courses, one of which is an Internship: SWRK-8521, SWRK-8547, SWRK-8610, SWRK-8611, SWRK-8630 or SWRK-8631, SWRK-8622, SWRK-8640, SWRK-8680, and SWRK-8681 (Advanced Practice Internship 6.0 credit hours).

Master of Social Work/ Juris Doctor (MSW/JD)

(As of Fall 2026, there are no new admissions to this program.

The MSW/JD is a dual degree program designed specifically for students who want to obtain both MSW and JD degrees. The program is structured to enable a student to obtain an MSW and a JD degree a full year sooner than if the student had chosen to pursue the degrees independently. Applicants who hold a Bachelor of Social Work Degree (BSW) can obtain an MSW and a JD in 3 years while applicants with an Honours degree in a related discipline can obtain the degree in 4 years. The course sequencing is planned so that students can gain experience in the two professions simultaneously, including two specialized courses that integrate law and social work knowledge, perspectives and professional identity.

Admission Requirements
Applicants to the MSW/JD program must meet the independent admission criteria of the Faculty of Law and the School of Social Work. Once an applicant has met the minimum requirements of the Faculty of Law and the School of Social Work, a joint committee will convene to determine the applicant's suitability for the MSW/JD program.

Two-Year full-time MSW Admission and Degree Requirements
1. Applicants may be admitted into the first year of the two-year full-time M.S.W. program provided they have satisfactorily completed a four-year honours undergraduate degree in a related social science discipline or helping profession from the University of Windsor or an approved university and have maintained a cumulative average of B in their undergraduate work.
2. Applicants to the two-year program will be expected to demonstrate awareness of contemporary social issues, effective communication, and motivation toward professional social work.
3. Students are required to complete a total of nine (9) courses and a practicum in the first year of study. Students are required to complete a total of six (6) courses and the Advanced Practice Internship (API) in the second year of study.

One-Year full-time MSW. Admission and Degree Requirements
1. Applicants may be admitted into the one-year full-time MSW program provided they have satisfactorily completed a BSW. from an accredited program and maintained a cumulative average of B.
2. All applicants must have successfully completed one undergraduate course in statistics and one in research methods.
3. Applicants should have volunteer or work experience in human service agencies or community organizations.
4. Students are required to complete a total of six (6) required courses in the one-year program.

JD Admission Requirements
The Faculty of Law emphasizes that no one single factor is solely determinative of admission to the law school. The Admission Committee assesses applications considering the criteria.

Please refer to the Faculty of Law for more details on JD admission and degree requirements.

SOCIAL WORK COURSES (SWRK-)

SWRK-8503. Comprehensive Social Policy Analysis
This course introduces students to the history of policy and how policies are created. Students will critically analyze the economic forces, political forces, cultural forces, social forces, and professional

issues that impact social policy. Students will explore their understanding of the impact social policies have on individuals, families, organizational infrastructures, service delivery systems, and network linkages. The formulation of policy recommendations will also be addressed.

SWRK-8504. Communication Skills in Social Work Practice
This course introduces students to the various types of communication skills utilized in advanced social work practice. Through in-depth examination of intentional interviewing and counselling skills, students will explore core social work values in relation to practice situations. Content focuses on the critical analysis of particular verbal and non-verbal forms of communication. A laboratory format will be employed to build student competencies in the effective use of interactional skills with clients and client systems.

SWRK-8521. Social Justice and Social Change
This seminar focuses on the critical analysis of systemic injustice. It will consider the history, meaning, consequences and dynamics of barriers that threaten, preclude or compromise the normal participation of selected vulnerable groups in social, economic and political institutions. It will critically examine concepts such as deviance, dependence, need, social control, and oppression. This critical analysis will form the underpinnings for leadership in the development and implementation of strategies for change.

SWRK-8531. Social Work Practice with Individuals
Students will develops a theoretical and applied understanding of foundational knowledge for advanced social work practice with individuals. Using a historical and ecological systems perspective, an emphasis is placed on multidimensional assessment and the differential application of therapeutic, supportive, educational, and resource management strategies for individuals. Specific attention is given to the needs of diverse populations in the context of social justice.

SWRK-8532. Social Work Practice with Groups
Students will critically examine the theoretical frameworks used in advanced social work practice with groups. Using an ecological systems perspective, students will use selected practice theories for social work with groups to develop knowledge, values, and skills in critical analysis, differential assessment, planning and intervention, and evaluation and termination with client groups. The challenges faced by diverse populations that affect group composition, development and processes are explored within the context of social justice. Assessment skills are used to identify group strengths, weaknesses, and challenges in formulating effective social work practice with groups.

SWRK-8533. Social Work Practice with Families
Students will analyze assessment and intervention with families. Using an ecological systems perspective, students will analyze the impact of diverse family structure and dynamics, cultural and social contexts, and the life cycle on family functioning. They will develop an understanding of their own family of origin issues as they impact self and work with families, critically analyze and differentially apply selected family therapy approaches, and appropriately apply social work values and skills when working with families.

SWRK-8534. Social Work Practice with Organizations and Communities
In this course, students will critically describe the political forces, cultural forces, social forces, and professional issues that impact working with organizations and communities. They will critically describe human diversity, human oppression, and social justice in the context of social work interventions with organizations and communities with particular attention to removing barriers to change and mobilizing or facilitating change with diverse populations. After evaluating procedures applicable to assessing organizational and community factors, students will design the implementation and facilitation of groups from an ecological perspective to advance change with clients and client systems.

SWRK-8547. Social Work Research: Practice Evaluation
This course prepares students to understand and critically evaluate use applied research in evaluating social work practice. The ideological assumptions underlying qualitative and quantitative research methods will be examined. Students will consider ethical issues as they conduct a literature review, identify a research problem relevant for interventions for diverse populations, formulate a research question and hypotheses, develop an appropriate design and methodology considering quantitative and qualitative options, and indicate appropriate analytical methods (statistical and/or qualitative).

SWRK-8550. Social Work Values, Ethics and Anti-Oppressive Practice
In this course, students will use an anti-oppressive focus to critically examine the nature, history, traditions, and issues of the social work profession as they relate to the development of a distinct theoretical knowledge-base, set of values, code of ethics, and approaches to direct and indirect practice. During the course, students will examine ethical questions and value dilemmas encountered by social workers in various fields of practice. Through value analysis and the application of ethical principles, the meaning of professionalism and its expression in social work are considered using contemporary practice case studies.

SWRK-8570. Field Integration Seminar
This seminar course focuses on the integration of academic and field work experience to advance knowledge, values, and skills as they relate to the development of advanced practice competence. Students will use structured reflection and self-evaluation to understand their own practice in terms of values, ethics, policies, theoretical models, and agency expectations. Students will reflect upon personal values and beliefs and explore solutions to actual issues during their field placements. (This course is evaluated on a pass/fail basis.)

SWRK-8571. Master of Social Work Foundation Year Practicum
This course is offered in a field education setting and is designed to assure the practice of advanced social work from the ecological perspective. The foundation practicum comprises 450 hours of supervised social work practice (Prerequisites: SWRK-8503, SWRK-8504, SWRK-8531, SWRK-8532, SWRK-8533, SWRK-8534, SWRK-8547, SWRK-8550.)

SWRK-8610. Advanced Direct Social Work Practice
This course will focus on the critical analysis of the theoretical basis for the application of a range of advanced professional social work theories and models to direct practice with diverse populations. Using ecological systems and strengths perspectives, students will analyze client empowerment and constructive transactions with the environment. Aimed at enhancing social justice, an analysis and critique of evidence-based practices with clients will be explored as vehicles to bringing about change.

SWRK-8611. Advanced Indirect Social Work Practice
Students will critically assess indirect social work practice with regards to community practice and human service organizations. Using an ecological perspective, students will examine community practice and human service organizations within the context of professional social work practice and by highlighting key indirect social work functions with a focus on community and organizational development.

SWRK-8622. Advanced Social Policy Analysis and Development
Building on the Comprehensive Social Policy Analysis course, this course focuses on the processes involved in policy formulation, implementation, and social change. Students will further refine their capacity to critically analyze social policies and generate recommendations that emanate from a global context.

SWRK-8625. Law and Social Work: Advanced Practice Research Methods and Policy Analysis
This course prepares students to use the practitioner-researcher model in the analysis of social policy, as it relates to law, in Canada. This model includes problem formation, qualitative and quantitative research design, data analysis and interpretation, and the dissemination of findings. Students will learn to apply specific analytic frameworks and theories, drawn from law and social work, to issues of Canadian social policy. In addition, students will learn essential elements of program evaluation including needs assessment, program logic models, implementation and process evaluations, and impact evaluations. Particular attention will be given to the implications of social policy for vulnerable and oppressed populations. Credit Weight 4.0. (May be offered as a cross-career course with LAWG-5930.).

SWRK-8626. Advanced Seminar in the Theory and Practice of Social Work and the Law
This seminar focuses on the intersection of law and social work in theory and practice. It will prepare students to think critically about the interrelationship between law and social work, both as disciplines and professions, and to identify and analyze theoretical and substantive areas of compatibility and tension. The challenges of interdisciplinary practice will be considered, with a particular emphasis on ethical norms and the advancement of social justice. (Open to MSW/JD students only, or with the permission of both program areas.) (Credit Weight 4.0.) (May be offered as a cross-career course with LAWG-5931.).

SWRK-8630. Challenges in Child Welfare
This course examines how biological, psychological, and social theoretical perspectives differentially explain the etiology, occurrence, and response to challenges influencing child welfare including physical illness, mental illness and substance abuse, economic adversity, and family and community violence. Specific attention is paid to disparate experiences of Indigenous Peoples and equity-seeking groups such as Francophone communities, and African, Caribbean, and Black communities. Both the impact of these challenges and strategies responding to these challenges will be appraised and critically analyzed.

SWRK-8631. Challenges in Health and Aging
This course examines how biological, psychological, and social theoretical perspectives differentially explain the etiology, occurrence, and response to challenges related to health and aging, including social determinants of health, physical illness, mental illness, substance abuse, economic adversity, and family and community connectedness. Specific attention is paid to the disparate experiences of Indigenous Peoples and equity-seeking groups such as Francophone communities, and African, Caribbean, and Black communities. Both the impact of these challenges and strategies responding to these challenges will be appraised and critically analyzed.

SWRK-8640. Program Design and Evaluation
This course prepares students to use the evidence-based practitioner-researcher model to critically evaluate social work practice with organizations and communities. Student will learn essential elements of program evaluation including needs assessments, program logic models, implementation and process evaluations, outcome evaluations, and impact efficiency evaluations. Students will design programs and develop evaluation proposals and will learn how to disseminate the results of program evaluations.

SWRK-8680. Advanced Internship Seminar
This capstone course must be taken concurrently with students' advanced practice internship SWRK-8681. This course provides a structured forum for students to discuss, synthesize and integrate the knowledge they have acquired throughout the program including practice theories, professional ethics, policy development, research and program evaluation. (Grading scale change from a percentage scale to Pass/Fail).

SWRK-8681. Advanced Practice Internship

This course is offered in a field education setting. Students develop skills which will equip them for leadership in advanced social work practice. The internship comprises 450 hours of supervised social work practice. (Prerequisites: SWRK-8610, SWRK-8611, SWRK-8521, SWRK-8622, SWRK-8640.)

SWRK-8970.Thesis
The thesis will integrate knowledge of research and evaluation methods to promote the acquisition of evidence-based practice to specific vulnerable populations. The thesis is supervised by the student's thesis committee. (3 lecture hours)

SWRK-9720. Epistemology and Philosophy of Science in Social Work
This course examines the epistemological foundations of social work research. The nature of knowledge, the different ways we come to know, and the social process in the distribution of knowledge are discussed. Critical analysis of the historical context, philosophical assumptions, and current debates related to each paradigm--positivist/postpositivist, interpretative, critical and postmodernism are explored. Students identify their own standpoint with respect to their dissertation research. The process by which social work researchers can advance evidence for practice within social justice principles for each of the available paradigms is emphasized.

SWRK-9730. History and Theory in Social Work
This course provides an in-depth examination of the development of the social work profession over the last one hundred years. An exploration of the impact of changing social, political, economic, moral, and historical contexts on the practice, theoretical and scholarly orientations of the profession will be highlighted. Key debates regarding the mission and development of professions in general and social work in particular; the relationship between practice, scholarship, and social policy; and tensions between disciplinary (and inter-disciplinary) approaches to social work knowledge development will be discussed within its national and international contexts. This seminar will also provide an examination of selected issues facing the profession today.

SWRK-9740. Qualitative Methods in Social Work Research
This course provides an overview of qualitative research design and application. It is intended to facilitate students' understanding in both designing, and in implementing their doctoral dissertation research or a sample of research involving qualitative methods. A number of designs are discussed as well as debates related to the position of the researcher, interviewing, ethics and diversity. The contribution of qualitative research to current models/issues of evidence-based social work practices, knowledge, truth and representation is also discussed. (3 lecture hours)

SWRK-9741. Qualitative Data Analysis
This course examines various approaches to qualitative data analysis and their grounding in various theoretical foundations. Students learn and practice multi-level approaches to data analysis, using software applications as data organization tools. Building on the qualitative methods course, students articulate the reasons for choosing certain approaches to analysis, referring to their consistency with various methodologies and theoretical foundations. The course applies the standards for rigour in qualitative analysis as a tool for evaluating various approaches. (3 lecture hours)

SWRK-9743. Quantitative Methods in Social Work Research
This course introduces students to quantitative research methods, including research designs, sampling methods, standardized measures, questionnaire design, meta-analysis and ethical consideration in conducting research. The course also covers the operationalization of social science concepts and scale construction, validity and reliability, and measurement error. Students gain knowledge about the current trends in evidence-based practice.(3 lecture hours)

SWRK-9744. Quantitative Data Analysis
This course provides an examination of the principles of quantitative data analysis with a focus on conducting and interpreting common bivariate and multivariate statistical procedures used in social science research. Parametric and non-parametric approaches are examined. Students gain competency

in the assumptions underlying statistical tests, the criterion for test selection, and the utilization of computer software analysis for analyzing small and large datasets. (3 lecture hours)

SWRK-9795. Dissertation Seminar
This course guides students through the process of developing a dissertation proposal. It covers each step of the research development process, from examining current knowledge to a description of how the data analysis will be conducted. It encourages students to consider the most appropriate methodology for their purposes (i.e., mixed, qualitative, and quantitative approaches). Students will also be supported through the process of obtaining approval for their project from the University of Windsor Research Ethics Board. (3 lecture hours)

SWRK-9980. Dissertation Research
Students work with a supervisor and committee to develop and implement an original research investigation. The results will be embodied in a professionally organized and written dissertation conforming to the requirements outlined in the School of Social Work PhD. Manual and by the Faculty of Graduate Studies. The dissertation is expected to be of the highest quality and suitable for publication (graded pass/fail).

SOCIOLOGY AND CRIMINOLOGY

PROGRAMS

Master of Arts in Criminology (MA)

Admission Requirements
The requirement for admission to the MA candidate year of the program is an Honours degree in Criminology or a related field from an accredited university. Applicants without an Honours degree in Criminology or a related discipline may be required to take additional courses. Students transferring into Criminology from a non-related discipline and those with insufficient preparatory background may be required to take additional courses before proceeding into the candidate year.

Applicants will be considered on the basis of:
Obtaining a 77% minimum cumulative average in the final two years of study (full- time equivalent) of the 4- year undergraduate degree.
Strong recommendations based on faculty observation of student's performance, work experience, or community involvement demonstrating clear commitment to and understanding of criminological concerns.
Background preparation and graduate faculty resources that are available in the area of specialization indicated on the application

Master of Arts in Criminology (MA)

COURSE STREAM:
Successful completion of **seven graduate courses** within 12 months (3 consecutive semesters):

Requirements:
SACR-8640. Contemporary Criminological Theory

Take one of the following:
SACR-8050. Quantitative Statistics and Analysis
SACR-8060. Qualitative Methodology (or)
SACR-8870. (Section 2) Mixed Methods/Paradigms and Ethics

Take two courses from the following:
SACR-8610. Crime and Exclusion
SACR-8620. Security and Regulation
SACR-8650. Law and Governance
SACR-8670. Current Issues in Criminology
SACR-8680. Critical Perspectives on Policy Development
SACR-8710. Critical Cultural Studies

Take three graduate courses from any SACR-8XXX course*

THESIS STREAM
Successful completion **of five graduate courses and Thesis** within 24 months (6 consecutive semesters):

Requirements:
SACR-8640. Contemporary Criminological Theory

Take one of the following:
SACR-8050. Quantitative Statistics and Analysis or
SACR-8060. Qualitative Methodology

Take one from the following:
SACR-8610. Crime and Exclusion
SACR-8620. Security and Regulation
SACR-8650. Law and Governance
SACR-8670. Current Issues in Criminology
SACR-8680. Critical Perspectives on Policy Development
SACR-8710. Critical Cultural Studies

One graduate course from any SACR-8XXX course*

SACR-8900. Directed Readings: Development of the Thesis Proposal
SACR-8970. MA Thesis

Thesis Stream Progress Requirements:
Students are required to complete all five courses in two consecutive semesters; 02-SACR-8900 should be taken during the second semester.

MA thesis students must complete their thesis proposals by the end of Term 3. Proposals must be defended by September 30th of their second year in the program. Students who have not set the date for their thesis proposals by July 1st will automatically be moved into the course stream so they can register for courses in the Fall term.

*One of which may be replaced by a graduate course from another department, subject to the department's approval

Important Program Requirement Details
Students may not take more than three (3) courses in a single term.
Students will proceed towards completing the degree by achieving at least a 77% cumulative average in all courses.
The minimum passing grade in a graduate course is 70%.
Seminar courses require active class participation. Instructors may therefore take into account class participation in grading students, in accordance with Senate regulations.

Master of Arts in Sociology (MA)

Admission Requirements
The requirement for admission to the MA candidate year of the program is an Honours degree in Sociology or a related field from an accredited university. Applicants without an Honours degree in

Sociology or a related discipline may be required to take additional courses. Students transferring into Sociology from a non-related discipline and those with insufficient preparatory background may be required to take additional courses before proceeding into the candidate year.

Applicants will be considered on the basis of:
Obtaining a 77% minimum cumulative average in the final two years of study (full- time equivalent) of the 4- year undergraduate degree.

Strong recommendations based on faculty observation of student's performance, work experience, or community involvement demonstrating clear commitment to and understanding of sociological concerns.
Background preparation and graduate faculty resources that are available in the area of specialization indicated on the application

Master of Arts in Sociology

COURSE STREAM
Successful completion of **seven graduate courses** within 12 months (3 consecutive semesters):

Take one of the following:
SACR-8000. Sociological Theory (or)

Take one of the following:
SACR-8050. Quantitative Statistics and Analysis (or)
SACR-8060. Qualitative Methodology, or
SACR-8870. (Section 2) Mixed Methods/Paradigms and Ethics

Take two from the following:
SACR-8210. Social Inequality and the State
SACR-8300. Work and Social Change
SACR-8400. Race and Ethnic Relations
SACR-8500. Family Relations and Gender Politics
SACR-8550. Sexualities and Social Justice
SACR-8690. Culture and Globalization
SACR-8710. Critical Cultural Studies
SACR-8800. Subordination, Identity and Empowerment

Three graduate level courses from any SACR-8XXX course *

THESIS STREAM
Successful completion of **five graduate courses and a Thesis** within 24 months (6 consecutive semesters):

Take one of the following:
SACR-8000. Sociological Theory or

Take one of the following:
SACR-8050. Quantitative Statistics and Analysis **or**
SACR-8160. Qualitative Research Design

Take two graduate level courses from any SACR-8XXX course *

SACR-8900. Directed Readings: Development of the Thesis Proposal
SACR-8970. MA Thesis

Thesis Stream Progress Requirements:
Students are required to complete all five courses in two consecutive semesters; SACR-8900 should be taken during the second semester.

MA thesis students must complete their thesis proposals by the end of Term 3. Proposals must be defended by September 30th of their second year in the program. Students who have not set the date for their thesis proposals by July 1st will automatically be moved into the course stream so they can register for courses in the Fall term.

*One of which may be replaced by a graduate course from another department, subject to the department's approval

Important Program Requirement Details
Students may not take more than three (3) courses in a single term.
Students will proceed towards completing the degree by achieving at least a 77% cumulative average in all courses.
The minimum passing grade in a graduate course is 70%.
Seminar courses require active class participation. Instructors may therefore take into account class participation in grading students, in accordance with Senate regulations.

Social Data Analysis (MA) (Joint Program with Psychology)

(Note: as of Fall 2014, there are no new admissions to this program.)

Admission Requirements
1. Applicants to the program must hold an Honours Degree in one of social sciences or closely related discipline.
2. Minimum major and cumulative averages of 70%.
3. At least 2 semester length undergraduate statistics courses with a 77% minimum average in these courses.
5. Three reference letters

Degree Requirements
PSYC-8511, SACR-8050, SACR-8070/SACR-8080 (cross listed as PSYC-8070/PSYC-8080), SACR-8794/SACR-8795 (cross listed as PSYC-8794/PSYC-8795), and two of PSYC-8512, PSYC-8513 or SACR-8050. Students may substitute PSYC-8513 for SACR-8050.

Program Sequencing
Students will complete their 6 courses in term 1 and 2 and complete their Final Project (SACR-8794/SACR-8795 cross-listed as PSYC-8794/PSYC-8795) during the Spring/Summer semesters.

Fall: PSYC-8511, SACR-8050, SACR-8070 (cross listed as PSYC-8070)
Winter: SACR-8080 (cross listed as PSYC-8080), and two of PSYC-8512, PSYC-8513 or SACR-8050
IS: SACR-8794/SACR-8795(cross listed as PSYC-8794/PSYC-8795)

PhD in Sociology with Specialization in Social Justice

Admission Requirements
In addition to the general requirements set out by the Faculty of Graduate Studies, the requirement for admission to the PhD. program in Sociology with Specialization in Social Justice is a Master's degree in Sociology (or equivalent) from an accredited university. Possession of the minimum academic requirements does not ensure acceptance.

Applications will be considered on the basis of the following:
1. Application documents submitted;
2. The availability of faculty to advise, supervise, and provide funding and research training in conjunction with their own research project;
3. The diversity of subject areas represented in the applicant pool; and,
4. Obtaining a 77% minimum cumulative average in the final two years of study (full- time equivalent)/MA degree

Degree Requirements
Successful completion of **five graduate** courses **plus the Dissertation**:

SACR-8000. Sociological Theory

Take one of the following:
SACR-8150. Statistics and Quantitative Methods
SACR-8160. Qualitative Research Design

Three graduate courses from any SACR-8XXX course*

SACR-9980 Dissertation
Two comprehensive examinations:
A dissertation proposal, which includes an oral defence
A dissertation, which includes an oral defence

*One of which may be replaced by a graduate course from another department, subject to the department's approval

NOTE: A PhD. student who has previously completed a MA in Sociology (or equivalent) may not use previously taken courses (or equivalent) towards their PhD. The five required courses taken during the PhD must be courses they have not taken before.

Comprehensive Examinations
After successful completion of all course requirements, the student must demonstrate mastery of two established and distinct fields of sociological inquiry through satisfactory completion of two comprehensive examinations. Students will not be able to move on to the second comprehensive exam until the first comprehensive exam has been successfully completed. Students failing a comprehensive examination after a second attempt will be required to withdraw from the program. The required PhD comprehensive examinations consist of exams in two distinct fields in the discipline of Sociology. The student will complete one thematic area based comprehensive and one dissertation lead substantive area comprehensive.

Dissertation Proposal with Oral Defence
After successful completion of the comprehensive examination requirements, the student moves on to the dissertation proposal. The dissertation proposal should be a concise document of no more than 20 pages that discusses: the central research topic of the dissertation; the significance and advancement

research literature; the theoretical framework guiding the research; proposed research methods; a plan and schedule for completion of the dissertation; the feasibility of the research project; and ethical issues raised by the research.

After successful completion of the dissertation proposal requirements, the student continues on with the dissertation. The dissertation is normally a book- length manuscript that makes an original contribution to knowledge. The dissertation should display a sophisticated awareness of the theoretical, methodological, and practical choices made during the research process and the implications of the research.
Important Program Requirement Details

Important Program Requirement Detail
Students may not take more than three (3) courses in a single term. Students will proceed towards completing the degree by achieving at least a 77% cumulative average in all courses. The minimum passing grade in a graduate course is 70%. Seminar courses require active class participation. Instructors may therefore consider class participation in grading students, in accordance with Senate regulations.

SOCIOLOGY AND CRIMINOLOGY COURSES (SACR-)

All courses listed will not necessarily be offered in any given year. All courses are taught as seminars.

SACR-8000. Sociological Theory
A seminar on current and emerging trends in social theory from social constructionism to world systems theory, including contemporary debates on impacts of globalization, modernity and postmodernity, and the recovery of neglected voices in sociological theory.

SACR-8010. Classical Social Theories and Beyond
A seminar on creative, critical, and reflexive modes of theoretical development and appropriation grounded in sections of classical social theory. Topics covered may include causality, power, justice, love, sexuality, the family, class, solidarity, religion, science, ideology, culture, state formation, and cosmopolitanism. Attention will be given to the discursive formation of the social sciences and epistemological, ontological, and normative debates.

SACR-8020. Social Theory and Social Justice
A seminar to develop the theoretical foundations of doctoral research by critically examining the location of research and researchers in the global system, presumptions concerning human subjectivity and empowerment, and the conceptualization and practice of social justice. (Prerequisite: permission of instructor.)

SACR-8050. Quantitative Statistics and Analysis
Construction and testing of regression and logit models, sampling, and questionnaire construction. Additional topics may be selected in view of the needs and interests of students.

SACR-8060. Qualitative Methodology
Examination and practice of qualitative methods used in social research. An examination of Students will critically examine the ethics and politics of research. The course is primarily designed to provide MA course-stream students with an opportunity to engage in various research methods and debates in the field.

SACR-8070. Survey Data

Student will work in teams to develop questionnaires, gather data, and prepare them for analysis. Extensive reading will be required on sample design, questionnaire design, and survey administration. (2 lecture, 1 laboratory hour each week.) (Cross-listed with PSYC-8070)

SACR-8080. Data Analysis
Students will explore their data and test hypotheses, drawing on methods from other graduate data analytic courses. Students will be required to write a final report which emphasizes communicating findings to non-specialists. (2 lecture, 1 laboratory hour each week.) (Cross-listed with PSYC-8080)

SACR-8150. Statistics and Quantitative Methods
Sociological applications of structural equation modeling, hierarchical modeling, log-linear models, multinomial and ordinal logits, consideration of the strengths and limitations of quantitative sociology and political issues in its exercise. (Prerequisite: SACR-8050 or permission of instructor.)

SACR-8160. Qualitative Research Design
An exploration of the epistemological assumptions and analytical tools that underpin the design of students' qualitative research projects. Students will be exposed to a variety of research issues in areas such as of sociological field work, select ethnographic techniques, the analysis of documents, and participatory action research. The course is designed to assist students in examining and employing specific qualitative methods to assist in the development of developing the methodological component of their thesis or PhD proposal.

SACR-8200. Social Movements and Popular Mobilization
Seminar on the theory and research of large-scale transformations through historical and cross-cultural examinations of such topics as the development and impact of social movements, states and social revolutions, and the mobilization of people around issues concerning human rights, working conditions, racism, gender, sexuality, environment, peace, poverty, and globalization.

SACR-8210. Social Inequality and the State
Seminar on the theory and research of structured inequality in the national and international context. The focus will be on the role of the state in creating, sustaining, and altering different aspects of inequality in terms of resource attainment, political ideology and behaviour. Policy related issues may include globalization, family, sexuality, multiculturalism, immigration, employment, crime, education, health and welfare.

SACR-8300. Work and Social Change
This course examines current research and theoretical approaches in the sociology of work with an emphasis on understanding the relationship between the transformation of work and broader social change in class, gender and ethnic relations. Areas of concentration may include the organization of production, worker control and resistance, state labour policies and legislation, unemployment, labour market segregation, and globalization.

SACR-8400. Race and Ethnic Relations
A comparative analysis of race and ethnic relations focusing on such issues as ethnic stratification and mobility patterns, assimilation and cultural pluralism, and policies and legislation governing multiculturalism, employment equity and collective rights.

SACR-8500. Family Relations and Gender Politics
An examination of historical and contemporary debates on gender politics within the context of family formation and social change in Canada. Special attention will be given to the gender division of labour, sexuality, economy and class, and to related social justice issues such as state regulation of marriage,

divorce, childcare and procreation, reproductive engineering and rights, and ideological power structures and practices that construct family members in particular social and cultural contexts.

SACR-8550. Sexualities and Social Justice
This course will investigate the relationship between sexuality, power inequalities and social change. This may include an examination of the impact of globalization processes on sexualities, the development of lesbian, gay, bisexual, transgender and queer identities and movements, the racialization and gendering of sexual identity (and the sexualization of racial, ethnic and gender relations), the criminalization of sexualities, and the construction of sexual 'health'.

SACR-8610. Crime and Exclusion
An exploration of research and theory on the conception, construction, and production of crime and other exclusionary processes. Substantive topics may include violence, victimization and the impact of culture, borders, inequalities, and regulatory agencies on crime and deviance.

SACR-8620. Security and Regulation
An examination of research and theory on the regulatory agencies of criminal law and social policy (e.g. courts, police, corrections, social service agencies), modes of regulation (e.g. discipline, surveillance, detention) and their application (e.g. to bodies, spaces, borders and subjectivities).

SACR-8640. Contemporary Criminological Theory
An advanced analysis of social theories in Criminology. Various perspectives will be covered including feminist, Marxist, cultural, postmodern, and constructionist theories.

SACR-8650. Law and Governance
This course examines perspectives on moral regulation, the social construction of law and law as governance. The focus will be the analysis of various forms of law, policy, and regulation. Substantive issues to be covered may include sexuality, immigration and exclusion, labour and economic policies, drug policies and communication, or cultural policies.

SACR-8670. Current Issues in Criminology
An examination of contemporary research in criminology, deviance, and/or social justice. Students will critically engage with the results of recent research central to these areas of investigations

SACR-8680. Critical Perspectives on Policy Development
This course provides an in-depth study of the process of policy formation, development, and implementation in the area of crime and criminal justice broadly defined.

SACR-8690. Culture and Globalization
This seminar course uses cultural perspectives to explore processes of globalization. Topics may include migration, mass mediated practices, transnational organizations, work and employment, and human rights.

SACR-8710. Critical Cultural Studies
A critical examination of popular culture within contemporary social and cultural contexts. Topics may include: media representations of crime/criminality/criminal justice, gender, sexuality, race/ethnicity; the role of power and inequality in cultural production; myth; ideology; and how media and popular culture inform and impact various forms of social policy.

SACR-8740. Health and Social Justice
Examines the social construction, production, and subjectivities of health and illness with reference to a variety of social justice developments and policy issues.

SACR-8800. Subordination, Identity and Empowerment
A micro level examination of the effects of subordination on everyday life in the generation of acquiescence and resistance, including the use of discourse in identity formation and popular ideologies.

SACR-8870. Selected Topics in Sociology
This course involves an examination of a selected topic within Sociology based on new developments in particular areas, special faculty interests, and opportunities afforded by the availability of visiting professors. Topics covered will vary from semester to semester.

SACR-8900. Directed Readings: Development of the Thesis Proposal
Students will register for this course with a faculty advisor in their declared area of specialization with the purpose of developing a thesis proposal. (Available for credit only in the MA program by thesis.)

SACR-8794. Directed Study Major Project I
Under the guidance of the instructor, the candidate will engage in research on a discipline relevant issue, using existing data set(s), leading to the production of a final project which entails empirically grounded policy suggestions. Students will select a Project Committee, review literature, and develop research question and identify data set(s). (Cross listed with PSYC-8794)

SACR-8795. Directed Study Major Project II
In the Summer Semester, operationalize concepts, recode variables, analyze data, write report and suggest policies. The final project will show evidence of methodological skills, knowledge of the relevant substantive area, and ability to define policy implications based on analyzed data. (Cross-listed with PSYC-8795)

SACR-8970. MA Thesis

SACR-9980. Doctoral Dissertation

ODETTE SCHOOL OF BUSINESS

PROGRAMS

Master of Business Administration Degree Program Information

The purpose of the Master of Business Administration program is to provide broad graduate study in the general field of business administration. It provides students with three important components to prepare them for management positions, academic knowledge, job skills and work experience. Graduate students have the opportunity of expanding their accounting, administrative, finance, marketing, management science and strategy expertise. The program emphasizes knowledge that prepares students for careers in private industry and business, for the public service, and for doctoral studies.

Admission Requirements
1. Applicants who have secured satisfactory standing (at least a B- average) in their undergraduate work may be admitted. Major consideration is given to the performance during the last two years of the undergraduate program. Applicants without an undergraduate degree who possess at least ten years of significant and senior professional, managerial, or entrepreneurial experience may be considered for admission to the MBA program. Possession of the minimum requirements for admission does not ensure acceptance.

Students must write the GMAT before applying for admission to the Faculty. Applicants who hold an M.B.A or a PhD. from a foreign University (or equivalent degree) in any discipline may not be required to write the GMAT. (Details of the Test may be obtained from The Educational Testing Service, Princeton, New Jersey, 08540.) The order form for the Bulletin of Information for the GMAT is available in the Office of the Registrar and in the MBA Office.

2. Students in the candidate year who maintain a 70% average or better will qualify for the M.B.A. degree.

Professional Accounting Designation
Students who are interested in pursuing both a professional accounting designation (i.e. CPA) and a MBA degree are advised to complete their accounting prerequisite course requirements while being registered in the Bachelor of Commerce for University Graduates program or the Post-Graduate Certificate in Accounting program. After successfully completing all the accounting prerequisite courses, students are encouraged to apply for admission to the MBA-Professional Accounting Designation.

Master of Business Administration (MBA)

Program Curriculum Structure
Total courses: 17:

The Odette MBA is a 16-month program that is challenging, intensive and exciting. This full-time program is divided into four semesters that combine core business fundamentals and theory with practical experience.

Degree Requirements
Admissions to the Odette MBA program are highly selective and seek students who can understand complex issues, manage multiple projects, and communicate effectively.

Applicants must have:
1. An undergraduate degree with a minimum grade point average of 70% or above in their last two years.
2. A completed Graduate Management Admission Test (GMAT) with an average score of 550 for accepted applicants.
3. Applicants must also upload one letter of reference, a resume, a letter of intent and will be subject to a qualifying personal interview.

All Fields
Fall
BUSI-8010. Leadership and Interpersonal
BUSI-8020. Core Concepts of Accounting I
BUSI-8030. Introduction to Financial Management
BUSI-8050. Marketing Management
BUSI-8140. Digital Business Systems

Winter
BUSI-8100. Core Concepts of Accounting II
BUSI-8120. Financial Management.
BUSI-8130. Human Resources Management.
STEN-8900. Entrepreneurship: New Venture Formation and Management
STEN-8110. Project Management I

Summer
MGMT-8600. Business Ethics and Sustainability
MGMT-8460. Dynamics of Business Negotiations
STEN-8120. Project Management II
STEN-8980. Strategic Management
BUSI-8150. Business Analytics

Fall
One of the following:
STEN-8930. MBA Mandate Consulting
BUSI 8960. Major Paper
Two 8000-level business courses
Two 8000 level business courses taken as part of the international exchange program

Master of Business Administration with Professional Accounting Specialization (-PAS)

Admission Requirements

To be admissible to the MBA-Professional Accounting Specialization program, applicants must meet the following requirements:

1. Successful completion of 120 credit hour undergraduate business degree or equivalent
2. A cumulative GPA of 70% in the previous academic degree/last 20 courses/ 4 full-time semesters and minimum average of 70% CGPA in Core Preparatory Courses.
3. Must be eligible to begin the CPA Professional Education Program (CPA PEP).
4. A completed Graduate Management Admission Test (GMAT) with a minimum score of 550 for accepted applicants.
5. Applicants must also upload two letters of reference, a resume, and a letter of intent.

Applicants who have a four-year Bachelor of Commerce degree, minimum two years of work experience, and a completed CPA designation, may qualify for advanced standing in the MBA Professional Accounting Specialization program. The determination for direct entry into the MBA phase of the program is granted by the MBA Professional Accounting Specialization Program Director.

GMAT may be waived based at the discretion of the MBA-PAS Academic Director.

The Fast Track MBA with Professional Accounting Specialization is specifically designed for students pursuing their CPA Designation who have met the requirements for entry into PEP/CPA Accredited Program.

Degree Requirements

Total Courses: 11

ACCT-8010. Advanced Topics in Financial Reporting
ACCT-8020. Advanced Topics in Management Accounting
ACCT-8050. Advanced Audit and Assurance
ACCT-8060. Advanced Topics in Taxation
ACCT-8080. Integrative Case Analysis
BUSI-8010. Interpersonal Dynamics
STEN-8980. Strategic Management
MGMT-8030. Performance Management and Governance
FINA-8040. Advanced Corporate Finance
BUSI-8140. Digital Business Systems
BUSI-8050. Marketing Management

Students who elect not to continue in the MBA-PAS may receive a Graduate Diploma in Accounting after successful completion of all accounting courses.

The MBA-PAS program will follow the sequence below:

Semester 1: (Accounting Phase)

ACCT-8010. Advanced Topics in Financial Reporting
ACCT-8020. Advanced Topics in Management Accounting and Control
ACCT-8050. Advanced Audit and Assurance
ACCT-8060. Advanced Topics in Taxation
ACCT-8080. Integrative Case Analysis

Semester 2: (MBA Phase)
BUSI- 8010. Interpersonal Dynamics
FINA-8040. Advanced Corporate Finance
BUSI-8050. Marketing Management

Semester 3: (MBA Phase)
STEN- 8980. Strategic Management
MGMT-8030. Performance Management and Governance
BUSI-8140. Digital Business Systems

Master of Business Administration Managers and Professionals (MBA M&P)

Admission Requirements

1. Four-year undergraduate degree or equivalent.
2. A completed Graduate Management Admission Test (GMAT) with a minimum score of 605 for accepted applicants.

a. GMAT can be waived at the discretion of the MBA Program Director.

3. A TOEFL, IELTS or other acceptable English language proficiency score for students whose first language is not English.
4. Satisfactory performance on personal interview.
5. Applicants must also upload a letter of reference, a resume, and a letter of intent.
6. A cumulative GPA of 70% in the previous academic degree/last 20 courses/ 4 full-time semesters.
7. Students must have a minimum of five years of full-time, progressive work experience in a professional setting.

Credit transfer is considered based on evaluation of undergraduate transcripts and work experience. Final determination on credit transfer is granted to Director of MBA Program.

Advanced Standing

Advanced standing may be granted based on undergraduate degree and/or work experience. Students with a Bachelor of Commerce or BBA are eligible for Advanced Standing for BUSI-8020. Core Concepts of Accounting I, BUSI-8030 Introduction to Financial Management, and BUSI-8000 Foundations of Business, and complete their MBA in 11 courses. Final approval for advanced standing is based on MBA Program Director approval and the University of Windsor Graduate Studies office.

Degree requirements

Students must maintain a 70% average in all courses. Failed courses must be retaken. A grade of 59% and below is a considered a failure. Students are only allowed two courses on final degree audit in the 60%- 69% range. In the event the student has more than two courses in this range, the student must retake the appropriate number of courses and achieve the minimum grade of 70% in each prior to confirmation of degree.

Total courses: 14 courses (or 11 courses with Advanced Standing)

BUSI-8000. Foundations of Business
BUSI-8010. Leadership and Interpersonal Dynamics
BUSI-8020. Core Concepts of Accounting l
BUSI-8030. Introduction to Financial Management

FINA-8040. Advanced Corporate Finance
BUSI-8050. Marketing Management
BUSI-8060. Managing Employees
BUSI-8150. Business Analytics
STEN-8110. Project Management l
STEN-8980. Strategic Management
ACCT-8500. Managerial Accounting and Analysis
(3) 8000-level. Business courses

Master of Business Administration/Juris Doctor (MBA/JD)

This special program provides students interested in a career combining management and legal skills with an opportunity to complete the MBA and JD. degrees in four years. The program is jointly administrated by representatives of the Odette School of Business, the Faculty of Law, and the Faculty of Graduate Studies.

Admission Requirements
The admission procedure for the integrated program consists of two stages. At the first stage, students applying to the program must meet the admission requirements of both the MBA and JD programs. Therefore, separate applications must be submitted to the Faculty of Law and the Faculty of Graduate Studies for admission to the regular degree program in Law and the MBA. To facilitate academic and career planning, it is strongly suggested that these applications be made simultaneously. Students who are accepted to both the MBA and JD programs will be accepted to the integrated program and will proceed to attend first year in either Faculty. Such students will be granted a deferred admission to the other Faculty in the program. This special deferred admission will be revoked if the applicant's performance in the first program fails to meet the first-year academic standards of the program. In such case the applicant may re-apply for regular admission to the second-degree program. Applications will also be considered for entry to the program from candidates who are attending the first year of either the JD or MBA. programs. They must meet the admissions requirements and application deadline for the program for which they are seeking entry.

For information on Application to the integrated MBA/JD visit the Faculty of Law at: http://www.uwindsor.ca/law/344/how-apply-mbajd.

Term Planning
The MBA/JD Program offers students the opportunity to experience two enriching education experiences, two degrees, in an accelerated, integrated manner.

MBA/JD students can enter into the program in one of two ways:
i) Defer law studies for one year, complete 15 course credits toward the MBA (with only the Major Paper (BUSI-8960), weighted at two course credits, remaining for completion) and then study Law in the regular manner for three years.
ii) Complete Year 1 of law studies and take a one-year leave of absence from Law. Once at the Odette School of Business, complete 15 course credits toward the MBA (again, with only the Major Paper (BUSI-8960) remaining for completion) and then return to Law and study in the regular manner for the remaining two years.

Option (i) is preferred because it allows the student to study with a cohort in both programs; however, students interested in the MBA who have completed only the first year of Law at the University of Windsor will have no problem completing the requirements in the two remaining years of study.

The sequence of courses would be identical to those studied by all MBA students, with one exception. With earning the 15 MBA. course credits, only the major paper (again, worth the equivalent of two courses) would remain to complete the program. The sequence is presented below:

Fall
BUSI-8010. Leadership and Interpersonal Dynamics
BUSI-8020. Core Concepts of Accounting I
BUSI-8030. Introduction to Financial Management
BUSI-8050. Marketing Management
BUSI-8140. Digital Business Systems

Winter
BUSI-8100. Core Concepts of Accounting II
BUSI-8120. Financial Management.
BUSI-8130. Human Resources Management.
STEN-8900. Entrepreneurship: New Venture Formation and Management
STEN-8110. Project Management I

Summer
MGMT-8600. Business Ethics and Sustainability
MGMT-8460. Dynamics of Business Negotiations
STEN-8120. Project Management II
STEN-8980. Strategic Management
BUSI-8150. Business Analytics
+ BUSI-8960. Major Paper (for MBA/JD students only)

To complete the two degrees, as stated, students commence (or return to) law studies in September. They are registered in Law and finish the remaining two or three years of the program (whichever is applicable). During the final year of Law studies (likely in the winter semester), the students will also submit and present their major papers. Once completed, a grade is assigned for the Major Paper and the 17 course credits required for the MBA are fulfilled.

The registration of students is straightforward. While studying for the core 15 course credits of the MBA., all students are registered full-time in the MBA (from September until August). However, when they return to Law the following autumn, the students will revert to full-time Law. They will complete the Major Paper (BUSI-8960) under that status, using the MBA/JD program status in UWinsite. Once completed, the Major Paper (BUSI-8960) will have its “IP” status converted to the grade that was earned.

Master of Management (MOM) (with/without Co-op)

The Master of Management is a program specifically designed for international students and students seeking a graduate level management degree in one of the program concentrations listed below. Applicants to the program select a concentration from one of the following fields: 1) Manufacturing; 2) Logistics and Supply Chain Management; 3) Human Resource Management; 4) International Accounting and Finance; 5) and Business Data Analytics. Please note that these concentrations are approved, but not necessarily offered.

The fields will be included on the Diploma parchment:
Master of Management, Human Resource Management
Master of Management, International Accounting and Finance
Master of Management, Logistic and Supply Chain Management

Master of Management, Manufacturing Management
Master of Management, Business Data Analytics

Admission Requirements
Admission to the Master of Management program is highly selective. Applicants must meet at least the following criteria:

1. Bachelor-level degree in an acceptable discipline from an academic institution approved by the University of Windsor;
2. The equivalent of a 70% average in undergraduate studies;
3. Where appropriate a TOEFL score of at least 560 (or proof of equivalent English language proficiency, such as MELAB or CAEL tests);
4. A successful interview with a representative from the Odette School of Business.

Degree Requirements
Total courses: 12 (Plus one work term for students in the Co-op program)

All courses are offered by the Odette School of Business Administration. In this program students follow a prescribed sequence of courses in cohort fashion, with no electives.

Co-op Stream: In addition to meeting the degree requirements of the Master of Management program, to graduate with co-op students also need to be successful in the Transform job readiness program (non-credit), the associated work term, and reflective activities. Master of Management co-op students must successfully complete one work term with a pass.

All Fields
BSMM-8110. Accounting Concepts and Techniques
BSMM-8120. Finance in a Global Perspective
BSMM-8130. Managing for Organizational Effectiveness
BSMM-8140. Marketing
BSMM-8000. Business Communications
BSMM-8320. Quantitative Methods
BSMM-8510. Business Strategy (capstone course)

Human Resource Management
BSMM-8345. Talent Planning and Staffing
BSMM-8355. Employment Law and Policy
BSMM-8365. Reward Systems, Talent Development, and Wellness
BSMM-8375. Strategic Human Resource Management
BSMM-8380. Managing Employee and Labour Relations

Manufacturing Field
BSMM-8330. Introduction to Business Logistics Management
BSMM-8340. Leadership and Organizational Change
BSMM-8520. Marketing Strategy and Planning
BSMM-8530. Manufacturing Strategy
BSMM-8540. Manufacturing and Globalization (Stream capstone)

Logistics and Supply Chain Management Field
BSMM-8330. Introduction to Business Logistics Management
BSMM-8350. Purchasing and Procurement
BSMM-8550. Domestic Transportation and International Shipping

BSMM-8560. Quantitative Analysis for Logistics and Supply Chain Management
BSMM-8570. Supply Chain Management (Stream capstone)

International Accounting and Finance Field
BSMM-8360. International Financial Reporting
BSMM-8370. International Financial Management
BSMM-8610. Consolidated Financial Statements
BSMM-8620. Accounting Systems Control and Auditing
BSMM-8630. Corporate Governance (Stream capstone)

Business Data Analytics Field
BSMM-8710. Introduction to Data Analytics
BSMM-8720. Data Analytics and Project Management
BSMM-8730. Data Acquisition and Management
BSMM-8740. Data Analytic Methods and Algorithms
BSMM-8750. Predictive Modeling and Decision-Making (Capstone)

Co-op Stream
BSMM-8990. Co-op Work Term I.

Master of Engineering Management (MEM) (Joint Program with Engineering)

The Master of Engineering Management program is offered jointly between the Odette School of Business and the Faculty of Engineering. For the regular Master of Engineering Management (MEM) Program: Fall semester intake only.

Admission Requirements
Admission will be granted, within the limits of program availability to students with the following credentials:
1. Bachelor of Applied Science degree in engineering (or other undergraduate degree (or equivalent) with related technical background) with an average of at least B (73%) from an accredited university
2. Proof of English language proficiency IELTS: 7.0 / IBT TOEFL: 100
3. CV/Resume
4. Statement of purpose letter
5. Preference will be given to candidates who have at least two years of relevant work experience in engineering or a related field

Degree Requirements

Total courses: 9 courses (30 credits)

Courses will be divided into:
A) Core Courses (6 courses for a total of 18 credits)
B) Non-core Courses (2 courses for a total of 6 credits)
C) Capstone Project Course (two semester course for a total of 6 credits)

Core Courses
All students need to complete the following 6 mandatory core business and engineering courses before taking any non-core courses:

Core Business Courses:
BUSI-8310. Financial and Managerial Accounting for Engineers
BUSI-8300. Applied Finance for Engineering Managers
STEN-8980. Strategic Management

Core Engineering Courses
INDE-8430. Product Innovation and Design Management
GENG-8020. Engineering Project Management
GENG-8050 Data Analytics and Decision-Making

Non-core Courses
Choose two from:
INDE-8390. Work Organization: Analysis and Design
INDE-8420. Supply Chain Management and Logistics
GENG-8060. Strategic Entrepreneurial Management
CIVL-8900 (Section 55). Special Topics in Civil Engineering (Decision Making/Sustainability)
MSCI-8040. Operations Management
BUSI-8050. Marketing Management
STEN-8820. Manufacturing Strategy
STEN-8920. Special Topics (depending on semester)
INDE 8900. Special Topics (Additive Manufacturing Technologies)
MECH 8006. Life Cycle Thinking for Engineering Projects

Capstone Project Course: all students must complete a capstone course offered jointly by the Faculty of Engineering and Odette School of Business. This course, BUSI-8400/GENG-8040 Engineering Management Capstone allows students to practice their theory by completing one of: 1) an engineering management report 2) engineering feasibility study, or 3) new venture business plan. Coordinators and associate deans from engineering and business will appoint instructors for this course. The teams and projects in this course should be managed in a manner similar to the existing corporate MBA project and with emphasis on student mentorship and project supervision by subject matter experts.

Mandatory Workshops (to be delivered on-campus during the first weekend in each term):
Students are required to complete all the following workshops before the end of the program:
1. Year 1 Winter Term: Team building and development
2. Year 1 Summer Term: Intellectual property with focus on engineering/technology
3. Year 1 Fall Term: Negotiation skills and practices
4. Year 2 Winter Term: Pre-capstone camp
All courses are used to calculate the major average.

Master of Business Administration/Doctor of Medicine (MBA/MD) (Concurrent Program with Schulich School of Medicine)

Admission Requirements
The admission procedure for the integrated program consists of two stages. At the first stage, students apply to the Doctor of Medicine Program at the Schulich School of Medicine and Dentistry, Western University. Upon acceptance, students would be required to complete their first year of studies. At the second stage, students would apply to the course-based MBA program at the University of Windsor. Therefore, separate applications must be submitted to Schulich Medicine at Western and to the Faculty of Graduate Studies at the University of Windsor for admission to the regular degree programs in both the

MD and the MBA. Students who are accepted to both the MD and MBA programs will automatically be accepted to the integrated program. After completing their first year in the MD program, students will take a one-year leave of absence after the second or third year of MD studies to complete their MBA, before returning to the MD program.

Term Planning
The MBA/MD Program offers students the opportunity to experience two enriching education experiences, two degrees, in an accelerated, integrated manner.

MBA/MD students can enter into the MBA program by deferring medicine studies for one year, complete 15 course credits toward the MBA and the Major Paper (BUSI-8960), weighted at two course credits, and then study Medicine in the regular manner.

The sequence of courses would be identical to those studied by all MBA students, with one exception (noted in italics). With earning the 15 M.B.A. course credits, only the major paper (again, worth the equivalent of two courses) would remain to complete the program. The sequence is presented below:

Degree requirements:
Total courses: 17

Fall
BUSI-8010. Leadership and Interpersonal Dynamics
BUSI-8020. Core Concepts of Accounting I
BUSI-8030. Introduction to Financial Management
BUSI-8050. Marketing Management
BUSI-8140. Digital Business Systems

Winter
BUSI-8100. Core Concepts of Accounting II
BUSI-8120. Financial Management.
BUSI-8130. Human Resources Management
STEN-8900. Entrepreneurship: New Venture Formation and Management
STEN-8110. Project Management I

Summer
MGMT-8600. Business Ethics and Sustainability
MGMT-8460. Dynamics of Business Negotiations
STEN-8120. Project Management II
STEN-8980. Strategic Management
BUSI-8150. Business Analytics
+ BUSI-8960. Major Paper (for MBA/MD students only)

Having met all the MBA requirements, students would then return to medicine studies in September. They are registered in medicine and finish the remainder of the MD Program.

The MBA Major Paper (BUSI-8960) for the purposes of the MBA/MD is to be completed under the supervisor of an Odette faculty member who is a member of the Faculty of Graduate Studies (FGS). Second committee members may be from medicine if they members of FGS. Generally, the required second committee member will also be an Odette faculty member who is a member of FGS. The MBA Major Paper (BUSI-8960) must follow requirements from FGS and includes a public defence.

Please note that the MD program offered at the University of Windsor is a regional campus for the Schulich School of Medicine and Dentistry at the University of Western Ontario.

ODETTE SCHOOL OF BUSINESS COURSES

Courses below are listed according to the internal administrative units of the Odette School of Business. All courses listed will not necessarily be offered in a particular term or year. Special permission to enter courses without the stated prerequisites must be arranged with the Dean and the instructor involved.

ACCOUNTING (ACCT-)

ACCT-8010. Advanced Topics in Financial Reporting
This course will advance the students' knowledge in a number of topic areas of accounting including: Financial Statement Reporting, Accounting Policies and Transactions Analysis, Financial Report Preparation, Financial Statement Analysis, Audit and Assurance, Treasury and Risk Management, Financial Analysis/Corporate Finance, Corporate and Personal Tax. (Prerequisites: ACCT-4570, ACCT-4580, ACCT-4590).

ACCT-8020. Advanced topics in Management Accounting
This course will advance the student's knowledge of how to apply forecasting and evaluation techniques and recommend improvements to operations, strategy, policy, and assurance. Recommendations based on analysis of facts will also comply with existing regulatory and legal frameworks. (Prerequisites are ACCT-4570 and ACCT-4590)

ACCT-8050. Advanced Audit and Assurance
This course equips Chartered Professional Accountant (CPA) candidates with the competencies necessary to perform both internal audit projects and external assurance engagements. (Co-requisite: ACCT-3600.)

ACCT-8060. Taxation III
The course concentrates on advanced income tax topics, including income tax planning for individuals and corporations and income tax research. The use of partnerships and trusts in tax planning and the corporate reorganization provisions of the Income Tax Act are studied. Tax research is conducted using the Income Tax Act, tax treaties and court cases. (Co-requisite: ACCT-4610 and mandatory for those seeking a Chartered Professional Accountant (CPA) for non-public accounting.

ACCT-8070. Integration and Team Building
This course further develops students' strategic leadership capabilities, problem solving, written and oral communication skills, ethical and professional behaviours, self-management and teamwork capabilities. Students are required to work in teams to analyze a complex business case and to present their findings to a panel of faculty members acting as senior executive managers / Board members. This course will prepare Chartered Professional Accountant (CPA) candidates for the Common Final Exam (CFE).

ACCT-8080. Integrative Case Analysis
This course prepares students for the final examination, the Common Final Exam (CFE). The complex and highly integrative cases, simulating real-life business issues will train students to draw on technical and enabling competencies acquired in previous courses to formulate a well-structured response within the allotted time.

ACCT-8500. Managerial Accounting and Analysis

Examines approaches to generating, analyzing, and using accounting information in performing managerial functions such as planning, controlling, performance evaluation and decision making.

ACCT-8510. Reporting, Analyzing, and Using Accounting Information
Examines alternative approaches to generating, analyzing, and using accounting information. It will emphasize the understanding and the application phases of accounting information by users. Topics include: Accounting entity-concepts of control and significant influence; accounting policy choice; internal control; elements in the consolidated financial statements, such as owners' equity, minority (non-controlling) interest and goodwill; profitability, liquidity and solvency analyses; working capital management; and business valuation.

ACCT-8590. Special Topics in Accounting
A reading and research seminar which deals with major concepts and important current problems in Accounting. The precise topic to be covered in a particular term will vary according to current interest and faculty availability, and will be announced in the previous term.

FINANCE (FINA-)

FINA-8040. Advanced Corporate Finance
This course develops students' ability to mobilize knowledge from various subject areas such as strategy, governance, risk management, management accounting and control to analyze, evaluate and improve overall organizational performance. This course will facilitate the development of technical and enabling skills required to prepare students for the changing role of professional accountants in organizations who are both strategic and financial leaders. (Credit may not be obtained for both ACCT-8040 and FINA-8040.)

FINA-8700. Investment Analysis and Management
Economic background to security analysis; types of corporate securities for investment; theory and mechanics of investment; general analysis and valuation procedures; valuation of fixed income securities and common stocks; procedures in analysis of government, industrial, financial, and public utility securities; and portfolio management.

FINA-8710. Portfolio Management
Objectives of individual and institutional portfolios. Security selection, diversification, marketability, risk and return in portfolio construction. Timing and formula plans, bond portfolio problems, performance measurement, trading problems, tax planning, supervision, quantitative techniques for portfolio management, and regulations.

FINA-8720. Cases in Financial Management
An advanced case course in financial management. Financial concepts and principles of managing a business enterprise are illustrated. Planning for the acquisition and use of funds so as to maximize the value of the business is examined through the use of case analysis.

FINA-8730. Topics in Finance
An in-depth study of topical issues in finance. A reading and research seminar dealing with major concepts and problems in the area of financial management. Precise topics to be covered during a term will vary according to current trends in the literature.

FINA-8740.International Financial Management
A study of the problems facing the international financial manager. Topics include: international markets, spot and forward currency fluctuations, positioning corporate funds, investment decisions, hedging and exposure management.

MANAGEMENT SCIENCE (MSCI-)

MSCI-8020. Special topics in Management Science
A reading and research seminar which deals with major concepts and important current problems in the areas of management science, operations management, or management information systems. The precise topic to be covered in a particular term will vary according to current interest and faculty availability, and will be announced in the previous term.

MSCI-8030. Management Science Models
Study of spreadsheet-based practical quantitative decision-making models relevant to major functional areas of business. Topics include linear and non-linear programming models, network models, and simulation models for problems involving uncertainty.

MSCI-8040. Operations Management
Study of relevant topics recognized as important factors for successful management of business operations. Topics include: processes and their measurement in manufacturing and services, forecasting, aggregate planning, inventory management, quality control, and supply chain management.

MSCI-8060. Strategic Implementation for Technologies Management
Strategic management of technology and innovation in established firms. The overall course objectives are to help students gain competence in (1) understanding the basic framework for the relationships among a business strategy, an information systems strategy and an organizational strategy; (2) developing an awareness of the range, scope and complexity of the issues and problems related to the strategic management of technology and innovation; (3) developing a conceptual framework for assessing and auditing the innovative capabilities of a business organization and (4) developing insight concerning the skills necessary to be effective in managing the innovation process. The course will use SAP, an enterprise resource planning software, as a simulation tool to explore the strategic use of information systems in a large organization.

MARKETING (MKTG-)

MKTG-8310. Consumer Behaviour
A study of analytical concepts and research techniques derived from the behavioural sciences or developed from consumer behaviour research. A significant objective of the course is the application of such concepts and techniques to the solution of marketing problems.

MKTG-8320. Marketing Research
An advanced course assuming familiarity with the conceptual research process, characteristics of basic data collection modes and measurement, hypothesis testing, regression analysis, and analysis of variance. Utilizing a discussion format, the course offers a review of current marketing research literature concerning: 1) examination of properties of familiar data collection and analysis techniques; 2) examples of their application; and 3) introduction to more advanced data collection and analysis methods.

MKTG-8350. International Marketing Strategy
A study of the problems faced by Canadian businesses when exploring and distributing to foreign markets. A significant objective of the course is to explore, through research findings, strategies that would improve Canada's international marketing efforts.

MKTG-8380. Special Topics in Marketing
This course is of varying content dealing with topical issues in marketing. The course might focus on a specific functional area in marketing or a particular environment for the application of marketing

concepts. Administration of the course varies as appropriate with its content and might take on a literature survey, research project, experiential, or other format.

MKTG-8390. Marketing Strategy and Planning
An analysis of the formation of marketing strategies and plans. Topics covered will include business definitions, developing marketing objectives, selecting market targets, developing all aspects of the marketing mix, and evaluating marketing performance. Marketing decision models, portfolio techniques, generic strategies, PIMS, and related topics will also be covered.

BUSINESS STRATEGY AND ENTREPRENEURSHIP (STEN-)

STEN-8110. Project Management I
Students will examine approaches to project management and apply project management principles to projects with industry partners. Project planning strategies for project implementation will be discussed relative to industry sectors. Problem solving, market research, critical thinking skills based on scientific inquiry in business will provide students with an understanding of project management competencies. Students will develop project management skills in their project teams with industry partners.

STEN-8120. Project Management II
The course provides students with experience solving project management issues for industry partners in real time. Students complete project management tasks for projects focused on the mature stages of the industry/product life cycle, such as management of legacy products and services. The team will construct detailed project plans, including a critical appraisal of relevant literature on the issues which arise in the industry projects. The students will construct viable solutions to address issues arising in the project plan. The students will present their findings to the industry partner and the class.

STEN-8696. Enterprise Development Consulting
Students will perform business consulting and market research for local organizations, giving them opportunities to network while applying skills and knowledge learned in the classroom to real life business situations. Semester-long projects covering different business areas are performed in small, supervised teams. Weekly class time is a round-table discussion format used for collaboration of ideas and strategy with the rest of the class. Students will be evaluated on participation along with formal reports and presentations regarding the projects. Highly motivated students from a variety of business-related disciplines will make-up the consulting team. (Prerequisites: Approval of instructor.) (Open to Semester 7 and above students only).

STEN-8800. Managing the International Enterprise
This survey course gives students a basic understanding of the international business environment and of the decisions that managers make in international firms. The course begins by considering the historical development of international business and the current global focus of international firms. It then examines the international global environment, including theories of trade and foreign direct investment, balance of payments and international institutions and models for evaluating the environment in order to select the best international strategy or mode of entry for a particular location. Finally, the course briefly examines the functional decisions made in international firms-financial, marketing, operational, human resources-and issues associated with international structure and control.

STEN-8820. Manufacturing Strategy
Examines the use of manufacturing and operations as weapons in the firm's competitive arsenal. It addresses strategic questions related to the choice of proper process technology, the determination of plant size and location, the extent of vertical integration and the continuous pursuit of quality and productivity.

STEN-8900. Entrepreneurship Formation and Management
This course examines entrepreneurship as an economic and a business phenomenon with special emphasis on the process of new venture creation. Through a mix of seminars, case studies, and field research, students explore the topics of finding new venture ideas, developing business ideas and business concepts, conducting feasibility studies, developing business plans, preparing deal structures, and financing strategies, launching new ventures, and initial entrepreneurial management beyond the start-up phase. Students are expected to undertake a new venture creation project culminating with a detailed business plan.

STEN-8920. Special Topics in Strategy and Entrepreneurship
This course involves an investigation and discussion of contemporary issues in strategic management and entrepreneurship. The topics to be covered will vary from term to term according to current developments in the business world.

STEN 8930. MBA Mandate Consulting
Students complete a consulting project for an organization. Project deliverables and scope must be approved by the Odette MBA Program Director or directing faculty member prior to student enrollment. Students may be required to complete a portion and/or all their work on-site at the Mandate Partner location. Students will be evaluated through regular course deliverables including a final presentation of their work plus Mandate Partner feedback.) (Cross-listed courses taken on International Exchange and BUSI-8960. Major Research Paper) (6.0 credit course.)

STEN-8980. Strategic Management for MBA Program
This capstone course integrates the knowledge gained in prior courses and focuses it on the functions of top management of an organization. Working in teams and individually, at the conclusion of the course students will have synthesized comprehensive analyses of relevant information including ethical considerations regarding strategic issues; applied the rational decision-making model to develop, recommend solutions to strategic issues; and communicated orally and in writing, feasible recommendations to resolve issues. (Prerequisites: candidate-year standing and all other required courses.)

STEN-8981. Strategic Management for MBA-PAS Program
This capstone course integrates the knowledge gained in prior courses and focuses it on the functions of top management of an organization. Working in teams and individually, at the conclusion of the course students will have synthesized comprehensive analyses of relevant information (e.g. MDandA, Budgets, financial statements, CPA codes of ethics, professional behaviour) to assess control of strategic processes; applied the rational decision-making model to develop, recommend solutions to strategic issues; and communicated in compliance with professional standards both orally and in writing, feasible recommendations to resolve issues. (Prerequisites: registration in the MBA-PAS program.)

STEN-8982. Strategic Management for MEM Program
This capstone course integrates the knowledge gained in prior courses and focuses it on the functions of top management of an organization. Working in teams and individually, at the conclusion of the course students will have synthesized comprehensive analyses of relevant information including ethical considerations, regarding strategic issues specific to innovation and commercialization of applied technology; applied the rational decision-making model to develop, recommend solutions to strategic issues; and communicated orally and in writing using appropriate professional format, feasible recommendations to resolve issues. (Prerequisites: registration, enrolment in, and candidate year standing in the Master of Engineering Management Program.)

STEN-8990. Capstone Project
This final Capstone Project is the culmination of the MBA for Masters and Professionals and is an opportunity for students to demonstrate and apply what they have learned in the program. The project can be undertaken with a current employer or a different organization. Students will be required to complete a final presentation and final written project.

BUSINESS (BUSI-)

BUSI-8000. Foundations of Business
This course takes a holistic approach to developing students' understanding of their roles as managers and professionals in business. The course emphasizes team-based learning and interactive participation, moving away from traditional lectures to foster engagement through case discussions and collaborative project work. Key themes in the course include the fundamental elements of strategic management, fostering strategic thinking, and enhancing critical thinking through case analysis. Students will develop analytical, decision-making, and interpersonal management skills, taking initiative and responsibility for their success throughout the course.

BUSI-8010.Leadership and Interpersonal Dynamics
This course provides students with the behavioural skills to be effective in organizations. Active listening, conflict resolution and running effective meetings, will be taught with a great deal of emphasis on the practice of these skills. The framework for this module will be the team environment, which many successful companies are moving toward. This module will help students prepare for the teamwork which will be required by all the concurrent modules.

BUSI-8020. Core Concepts of Accounting I
An introduction to the role and importance of accounting information in the decision-making process and how to use and interpret various types of accounting information found in financial statements and annual reports. Core concepts of financial accounting will be examined, including the determination of income and the recognition, measurement and reporting of assets, liabilities, and owners' equity. The impact of ethical, regulatory and environmental aspects on the interpretation and application of accounting information will be considered.

BUSI-8030. Introduction to Financial Management
This course introduces the concepts and principles of financial management of the business enterprise within the global financial environment. After an introduction to domestic and international financial markets and instruments, the module covers the concepts of value, risk, and efficient markets followed by an introduction to capital budgeting, financial analysis and planning, and short-term financial management.

BUSI-8040. Quantitative Techniques in Management
Provides students with a basic but solid background in the quantitative techniques used by successful business organizations. This module will focus on the important aspects of probability and statistics as they relate to the effective presentation of data and to decision-making under uncertainty; and on the use of mathematical modelling as it relates to problem-solving within an organization.

BUSI-8050. Marketing Management
This course introduces appropriate marketing management concepts and techniques that can be applied to private sector business as well as to not-for-profit organizations' marketing and communication activities. Emphasis will be on the marketing mix elements of product, price, place, and promotion.

BUSI-8060. Managing Employees
Familiarise students with the knowledge, roles, responsibilities and skills required of today's managers. Three approaches will be examined: systems, process, and behavioural. The contingency view of management as the process of organising resources to set and accomplish organizational goals will be emphasized.

BUSI-8070 Financial and Managerial Accounting

This course concentrates on financial reporting and interpretation to internal and external stakeholders of the organization. It emphasizes the use of accounting information as part of the planning, decision-making, and control processes. Issues of income determination, asset and liability recognition, measurement and reporting will be addressed. It also offers an introduction to management's use of internal accounting information for planning, managing, controlling and evaluation of business operations. Topics include cost concepts (including activity-based costing), budgeting, cost-volume-profit analysis, standard costing, performance evaluation and product pricing.

BUSI-8100. Core Concepts of Accounting II
This is a continuation of BUSI-8020. This course further examines the use and interpretation of accounting information within the context of business and business decision-making. It will explore some of the ways in which accounting information may be utilized for business planning and to solve common business management problems. Core concepts of managerial accounting such as financial statement analysis, tax considerations, cost-volume-profit analysis, budgeting, cost allocation, job order and process costing will be covered. As with BUSI-8020, the impact of ethical, regulatory, and environmental aspects on the interpretation and application of accounting information will be considered.

BUSI-8110. Research Methodology
This course provides students with a broad understanding of methodological issues in research with a specific focus on marketing. Students will develop an understanding of research issues and processes from a business discipline perspective through classroom lectures as well as a hands-on, practical research project. Both quantitative and qualitative methods of research will be discussed.

BUSI-8120. Financial Management
This course examines the firm's long-term financial decisions. It focuses on the sources and the mechanics of obtaining long-term financing, together with a discussion of strategic decisions involving capital structure and dividends. The module includes a broader study of financial markets and instruments, including options, with applications in financial management.

BUSI-8130. Human Resources Management
The course introduces the role of human resources activities in facilitating the achievement of organizational effectiveness. Students will examine the principles of human resources management and develop some skills they can apply in solving actual people problems at work. Particular attention is given to the roles of labour relations and trade unionism as they pertain to human resources activities. Students will be provided with exposure to both a management and labour perspectives to human resources issues.

BUSI-8140. Digital Business Systems
Students will learn how to envision, design and evaluate computer-based solutions to typical business problems. The emphasis will be on the contemporary and emerging hardware/software tools, the managing of information, and information technology.

BUSI-8150. Business Analytics
This course introduces business analytics concepts, methods, and models that develop a student's ability to interpret, explain and analyze data. Students are provided with the background in quantitative techniques and probability theory that is necessary to understand and use analytics to solve business problems and make effective business decisions. Theoretical understanding is reinforced using practical business analytic tools such as Excel to construct effective data visualizations and to conduct descriptive, predictive, and prescriptive analytics.

BUSI-8300. Finance for Engineering Managers

The course covers the fundamental principles of financial management of business enterprises within the global financial environment. It also includes introduction to financial analysis, planning and models with applications for new ventures and corporations. There will also be specific focus on the entrepreneurial process, start-up finance, venture math, business valuation methods and new venture fundraising techniques. (Antirequisites: BUSI-8030 and BUSI-8120

BUSI-8310. Financial and Managerial Accounting for Engineers
It is designed to provide engineers with a robust understanding of the core concepts and procedures of financial and management accounting which engineers need to enhance their capabilities as informed future managers and decision makers. It concentrates on financial reporting and interpretation to internal and external stakeholders of the organization. Issues of income determination, asset and liability recognition, measurement and reporting will be addressed. It also offers an introduction to management's use of internal accounting information for planning, managing, controlling and evaluation of business operations. Topics include cost concepts (including activity-based costing), budgeting, cost-volume-profit analysis, standard costing, performance evaluation and product pricing. (Antirequisites: BUSI-8120)

BUSI-8400. Engineering Management Capstone
This is a jointly instructed and administered course between the Faculty of Engineering and the Odette School of Business. The course is the last course students take in the Masters of Engineering Management program and has mandatory prerequisites. The goal is to allow students to practice all business and management theory they learned in previous courses by completing one of: 1) an engineering management report 2) an engineering feasibility study, or 3) a new venture business plan. This course is entirely project-based. (Prerequisites: All 6 mandatory core courses within the MEM program)(2 semester, 6.0 credit course) (Cross-listed with Engineering GENG-8040)

BUSI-8514. Management Information Systems
Learn how to envision, design and evaluate computer-based solutions to typical business problems. Emphasis will be on the contemporary and emerging hardware/software tools, the managing of information, and information technology.

BUSI-8606. Strategic Implementation for Technologies Management
Strategic management of technology and innovation in established firms. The overall course objectives are to help students gain competence in (1) understanding the basic framework for the relationships among a business strategy, an information systems strategy and an organizational strategy; (2) developing an awareness of the range, scope and complexity of the issues and problems related to the strategic management of technology and innovation; (3) developing a conceptual framework for assessing and auditing the innovative capabilities of a business organization and (4) developing insight concerning the skills necessary to be effective in managing the innovation process.

BUSI-8610. Business Law
This course examines common law principles and statutes affecting the business administrator's decision-making process.

BUSI-8613.Leadership and Organizational Change
Provides an analytical framework to understand organizational transformation through (a) leadership and vision building, (b) strategic human resources planning (c) restructuring and redesigning and (d) organization environment interactions. Students will focus on the practical aspects of diagnosing the need for change and supporting, facilitating, or leading the change process.

BUSI-8646. Dynamics of Business Negotiations

The course examines the role of effective negotiation for resolving conflict and sharing resources and power in complex organizations. Students will be exposed to various styles of negotiating, problem solving and bargaining strategies as well as communication approaches aimed at enhancing organizational performance.

BUSI-8647.Business Negotiation and Problem Solving
Highlights the role of effective negotiation for resolving conflict and sharing resources and power in complex organizations. Students will be exposed to various styles of negotiating, problem solving and bargaining strategies as well as communication approaches aimed at enhancing organizational performance

BUSI-8651.Reporting, Analyzing, and Using Accounting Information
Examines alternative approaches to generating, analyzing and using accounting information. It will emphasize the understanding and the application phases of accounting information by users. Topics include: Accounting entity concepts of control and significant influence; accounting policy choice; internal control; elements in the consolidated financial statements, such as owners' equity, minority (non-controlling) interest and goodwill; profitability, liquidity and solvency analyses; working capital management; and business valuation.

BUSI-8660. Management Skills Development
This course is designed to provide students with the management skills required for providing feedback, dealing with problem employees, coaching, and problem-solving. It is a practical course with ample opportunity for students to practice the skills in different settings and receive feedback on their performance. (Required for, and open only to, Fast Track students)

BUSI-8661. Directed Study
Under faculty supervision, students undertake an in-depth, individualized program of study to pursue a topic of relevance to business and to develop, apply, and integrate the knowledge acquired in the program.

BUSI-8662. Advanced Business Agreements
This intensive seminar course provides learning experiences at the intersection of law and business. Through readings, mini lectures, and analysis of business agreements, students prepare for participation in class discussions to engage in active and collaborative learning. Discussions focus on real business agreements used as case studies to enhance experiential, interdisciplinary learning, where the diversity of the course learning community provides multiple perspectives to unpack different agreements.

BUSI-8672.Maximizing the Value of the Organization
An advanced case course in financial management. Financial concepts and principles of managing a business enterprise are illustrated. Planning for the acquisition and use of funds so as to maximize the value of the firm is examined through the use of case analysis.

BUSI-8673. Special Topics in Business
This course explores and applies theory to contemporary business issues. (Prerequisite: A minimum required grade of 80% and a minimum cumulative average of 75%.)

BUSI-8680.Managing in the International Arena
Focuses on the problems and issues that confront managers in the area of international business. The course examines the international global environment, including theories of trade and foreign direct investment, balance of payments and international institutions and models for evaluating the environment in order to select the best international strategy or mode of entry for a particular location. A

major objective is to develop a sensitivity that will enhance the student's ability to operate in the complex environment of international business.

BUSI-8930. MBA Mandate Consulting
Students complete a consulting project for an organization. Project deliverables and scope must be approved by the Odette MBA Program Director or directing faculty member prior to student enrollment. Students may be required to complete a portion and/or all their work on-site at the Mandate Partner location. Students will be evaluated through regular course deliverables including a final presentation of their work plus Mandate Partner feedback.) (Cross-listed courses taken on International Exchange and STEN-8960. Major Research Paper)(6.0 credit course.)

BUSI-8690.Entrepreneurship: New Venture Formation and Management
Aiming at developing entrepreneurial thinking in students, this course examines entre- and intrapreneurship as an economic and a business phenomenon with special emphasis on the process of new venture creation. Students explore the topics of finding new venture ideas, developing business ideas and business concepts, conducting feasibility studies, developing business plans, preparing deal structures and financing strategies, launching new ventures, initial entrepreneurial management beyond the start-up phase and the successful development of such initiatives within a corporate environment.

BUSI-8698.Strategic Management
This is the capstone course of the M.B.A. program. It integrates the knowledge gained in prior courses and focuses it on the functions of top management of an organization. Discussion of concepts and current practice are combined with case studies of strategic leadership and strategy formulation and implementation in a domestic and international environment.

BUSI-8701. MBA Co-op Work Term I

BUSI-8702. MBA Co-op Work Term II

BUSI-8711.Fast-Track M.B.A Co-op Work Term

BUSI-8960. Major Paper (weight: 2 courses)

BUSI-8970. Thesis (weight: 4 courses)

MASTER OF MANAGEMENT (BSMM-)

BSMM-8000. Business Communications
Building on an understanding of the communication process and barriers to communication, students develop, the sensitivity and flexibility required to address the needs of different audiences. Throughout the course, communication strategies and practical skill building for leaders is stressed. Time is also devoted to communication concepts and techniques as well as case studies outlining issues faced by communicators in organizations. Students are taught a rhetorical approach to communication that utilizes communication strategies and best practice methods for planning and organizing ideas in business writing and presenting to achieve communication goals. Through teaching and interactive class discussions, role play and workshops, individual and group presentations, and written assignments, students come to understand that becoming a highly effective communicator is a learned, active process and a necessary skill base of any leader

BSMM-8110. Accounting Concepts and Techniques

An examination of the core concepts of financial accounting, which includes the determination of income and the recognition, measurement and reporting of assets, liabilities, and owners' equity. Different methods of the utilization of accounting information for business planning and management problem solving will be explored. Core concepts of financial and managerial accounting such as financial statement analysis, tax considerations, cost-volume-profit analysis, budgeting, cost allocation, job order and process costing will be covered. The impact of ethical, regulatory, and environmental aspects on the interpretation and application of accounting information will be considered.

BSMM-8120. Finance in a Global Perspective
A study of concepts and principles of financial management of the business enterprise within the global financial environment. Emphasis will be placed on the contemporary and emerging hardware/software tools, information management, and information technology. Following an introduction of domestic and international financial markets and instruments, the concepts of value, risk, and efficient markets will be covered. Capital budgeting, financial analysis and planning, and short-term financial management will also be introduced. With these concepts in hand, the student will learn how to envision, design, and evaluate computer-based solutions for typical business problems.

BSMM-8130. Managing for Organizational Effectiveness
This course examines organizational behaviour theories in depth and explores how these can be applied to foster effective organizations. It addresses topics that include individual outcomes (i.e., job performance, organizational commitment, retention, job satisfaction), interpersonal dynamics (i.e., power, politics, conflict), organizational structure and design, and organizational culture and change. Attention will be given to motivating behaviour in organizations, fostering effective teams, and leadership. Students will acquire an understanding of the individual, group, and organizational processes that drive behaviour within organizations.

BSMM-8140. Marketing
An introduction to marketing management concepts. Emphasis will be placed on the marketing environment, segmentation, targeting, positioning, consumer behaviour, and the marketing mix elements of product, price, place, and promotion. An introduction of marketing management concepts and techniques that can be applied to private sector business as well as to not-for-profit organizations' marketing and communication activities. Emphasis will be placed on the marketing mix elements of product, price, place, and promotion.

BSMM-8310. International Business
A survey course providing a discussion of the international business environment and the decisions made by managers in international firms. Historical development of international business and the current global focus of international firms will be considered. The international global environment, including theories of trade and foreign direct investment, balance of payments and international institutions, and models for evaluating the environment in order to select the best international strategy or mode of entry for a particular location will be examined. Finally, the functional decisions made in international firms – financial, marketing, operational, human resources – and issues associated with international structure and control will be briefly examined.

BSMM-8320. Quantitative Methods
This course provides the knowledge and skills needed to understand and analyze qualitative and quantitative business data using quantitative methods. Emphasis is placed on developing a robust understanding of data types, probability theory, sample distributions, data sampling, descriptive statistics, and basic analysis of data using statistical techniques such as t-tests, ANOVA, correlational

analysis, and basic linear regression. The course also explores the construction and testing of hypotheses in business contexts. Students develop their capacity to assess the validity and reliability of quantitative analysis and to effectively communicate the results of quantitative analysis in written and visual form. Some consideration is given to the ethical implications of reliance on quantitative analysis in business contexts. Use of common software tools for statistical analysis such as Excel, SPSS, Stata, and SAS is introduced.

BSMM-8330. Introduction to Business Logistics Management
A discussion of major issues relating to distribution activities at a micro and macro level. The development of channel systems and the behavioural and legal aspects of channel relationships will be reviewed. Distribution systems will also be discussed and will include such topics as management transportation, inventory management, warehousing, materials handling, and customer order processing.

BSMM-8340. Leadership and Organizational Change
An exploration of an analytical framework to understand organizational transformation through leadership and vision building, strategic human resources planning, restructuring and redesigning, and organization environment interactions. Students will focus on the practical aspects of diagnosing the need for change and supporting, facilitating, or leading the change process.

BSMM-8345. Talent Planning and Staffing
Provides a rigorous examination of organizational efforts to match people and jobs, onboard recruits, and make selection decisions. Topics include employer branding, job analysis, recruitment and selection, onboarding, business closure, and termination and outplacement practices. Emphasis is placed on how effective, equitable workforce planning, recruitment, and selection systems can be used to foster organizational success.

BSMM-8350. Purchasing and Procurement
A discussion of effective purchasing techniques and strategies to lower total costs and increase quality within the organization. The course will focus on developing, implementing, and using purchasing systems and policies that support the acquisition of materials. Quality assurance, sourcing of supplies, and inventory management will be included.

BSMM-8355. Employment Law and Policy
Examines the role that workplace legislation plays in shaping the workplace environment. A systematic overview is given of the legal and regulatory frameworks that govern employer-employee relations in union and non-union workplaces. The course focuses on laws and regulations related to employment standards, collective bargaining, arbitration, union certification, and human rights. Some consideration is also given to other legislation of relevance to human resource management including laws related to payroll taxes, pensions, and privacy. The course aims to prepare students to evaluate and respond effectively to the wide range of legal issues encountered in practice. Students are also encouraged to consider how laws and policies influence equity, diversity, and inclusion in the workplace.

BSMM-8360. International Financial Reporting
An exploration of the international environment of financial reporting. Particular emphasis is placed on International Accounting and Financial Reporting Standards. The preparation and presentation of financial statements, including such matters as accounting for tax, foreign currency transactions, and interim financial reporting will be reviewed.

BSMM-8365. Reward Systems, Talent Development and Wellness
This course examines how organizations can foster employee performance, construct reward systems, promote employee wellness, and develop and manage employee talent. The roles that organizational health, safety, and wellness play in developing and maintaining a strong organizational culture and a productive workforce are also examined. Students are challenged to assess organizational health, safety, and wellness practices, compensation and reward systems design, performance management systems, training programs, and succession planning. The course also provides an overview of relevant legislation such as the Occupational Health and Safety Act and its application.

BSMM-8370. International Financial Management
A study of the problems encountered by an international financial manager. Topics to be discussed include: international markets, spot and forward currency fluctuations, positioning corporate funds, investment decisions, hedging, and exposure management.

BSMM-8375. Strategic Human Resource Management
Examines key responsibilities of the human resource function and how human resource management can contribute to organizational success. A particular emphasis is placed on understanding and assessing the alignment between HRM practices and business strategy. Students will develop the ability to understand how human resource practices can be structured to provide competitive advantage and ensure that organizations remain responsive to changing environmental circumstances. Additional topics include the development of human capital and social capital as a strategic resource, HRM fit analyses, and resource-based perspectives on HRM.

BSMM-8380. Managing Employee and Labour Relations
An in-depth exploration of employee-management-union relationships. Students will gain an understanding of the dynamics of employee-management relations and acquire the theoretical and practical foundations needed to effectively manage these relations. Topics include differences between union and non-union workplaces, employee rights, diversity management, and the nature of collective bargaining agreements. The course will also explore industrial relations processes including those related to collective bargaining, dispute resolution, and the formation and operation of labour unions.

BSMM-8510. Business Strategy
This is the capstone course of the Master of Management program. It integrates the knowledge gained in prior courses and focuses this knowledge on the functions of top management in an organization. Discussion of concepts and current practice are combined with case studies of strategic leadership and strategy formulation and implementation in a domestic and international environment.

BSMM-8520. Marketing Strategy and Planning
An analysis of the formation of marketing strategies and marketing plans. Topics to be covered will include business definitions, developing marketing objectives, selecting market targets, developing all aspects of the marketing mix, and evaluating marketing performance. Marketing decision models, portfolio techniques, generic strategies, PIMS, and related topics will also be covered.

BSMM-8530. Manufacturing Strategy
An analysis of the use of manufacturing and operations as weapons in the firm's competitive arsenal. Strategic questions related to the choice of proper process technology, the determination of plant size and location, the extent of vertical integration, and the continuous pursuit of quality and productivity will be addressed.

BSMM-8540. Manufacturing Globalization (Manufacturing stream capstone)
The impact of international trade and of global technology, production, marketing, and social changes on the past development and future prospects of the manufacturing sector will be examined in this special seminar course.

BSMM-8550. Domestic Transportation and International Shipping
A study of the regulatory, economic, and management aspects of transportation. The needs and interests of the carriers, governments, and the shipping industry will also be studied. An evaluation of carrier alternatives for both passengers and the cargo in terms of their relative advantages and disadvantages will be discussed.

BSMM-8560. Quantitative Analysis for Logistics and Supply Chain Management
An introduction to the use of quantitative approaches in decision-making. Linear programming (model formulation and applications, computer solution, sensitivity analysis, and interpretation), transportation models, project management, PERT/CPM, and inventory control will be among the topics discussed.

BSMM-8570. Supply Chain Management (Logistics and Supply Chain Management Stream Capstone)
A special seminar course designed as a capstone for the Logistics and Supply Chain Management stream. An integrative perspective of supply chain strategy, supply chain finance, supply chain information systems, product design, relationship building, and ERP will be provided.

BSMM-8610. Consolidated Financial Statements
An in-depth review of such matters as definitions of subsidiaries, associates, and joint ventures; equity accounting; exclusions from consolidations; and the preparation, presentation, and analysis of consolidated balance sheets and income statements.

BSMM-8620. Accounting Systems Control and Auditing
An exploration, from an international perspective, of accounting systems control and auditing. The framework and regulation of controls and audits, planning and risk, internal controls, audit evidence, group audits and reporting will be covered.

BSMM-8630. Corporate Governance (International Accounting and Finance Stream Capstone)
An analysis of matters of corporate governance and managerial responsibility to the organization's stakeholders with special reference to the regulatory framework, business ethics, and the consequences of failures in governance.

BSMM-8650. International Management
Focus is placed on the problems and issues that confront managers in the area of international business. A major objective will be to develop a sensitivity that will enhance the student's ability to operate in the complex environment of multi-cultural business. Background materials, cases, and exercises will involve the students in the challenges facing the international manager.

BSMM-8660. Managing for High Performance
An examination of the preparation needed to manage the unexpected in a time of organizational turbulence and change. Primary focus will be placed on the organization's approaches required to develop their staff and their structures so they can meet challenges with flexibility rather than rigidity.

BSMM-8670. Current Human Resource Trends (Human Resources Management stream capstone)
A reading and research seminar that examines major concepts and important current problems in international Human Resources Management. Issues such as executive and management compensation, implementation of international labour standards in developing societies, development of an effective workforce, and dealing with outsourcing of corporate activities will be covered.

BSMM-8710. Introduction to Data Analytics
This course provides students with foundational understanding of core data analytics concepts, tools, and techniques as a basis for understanding the full range of methods available to data analytics professionals. Students are introduced to widely used methods including descriptive methods, data visualization techniques, supervised and unsupervised models for prediction and classification, times series modeling, text analysis methods, and various artificial intelligence models. Emphasis is placed on understanding the strengths of these methods, their limitations, and how they can be evaluated and used to solve practical business problems. Students are also introduced to common tools that are used to support data analytic efforts such as Excel, SAS, SPSS, Stata, R, Python, and Tableau.

BSMM-8720. Data Analytics and Project Management
The focus of this course is placed on the problems and issues that confront project managers in the area of data analytics, including the introduction of organizational, managerial, and technical constructs and

principles as well as a variety of coding tools and techniques that project managers employ in data analytics. A major objective is to develop professional capabilities on business problem identification and framing, analytics problem identification and framing, and the deployment of appropriate IT and analytical tools to solve identified problems in order to enhance the students' ability to manage analytical projects in a more effective manner

BSMM-8730. Data Acquisition and Management
This course examines processes, methods, and software tools used to acquire and manage business data. Students are introduced to common data modeling techniques and methods used to collect, integrate, clean, correct, transform, and consolidate data. Consideration is given to the treatment of internal business data, data collected using primary methods such as surveys, and data collected from secondary sources such as census data and public health data. Some attention is given to the processes used by organizations to manage information throughout its lifecycle. Best practices in information governance and important ethical and privacy issues related to the collection and management of data are also examined. Students are introduced to relational and nonrelational database management systems such as SQL Server, MySQL, PostgreSQL, and MongoDB and provided with foundational knowledge in the use of tools such as SQL and Python to acquire, store, update, and retrieve data.

BSMM-8740. Data Analytic Methods and Algorithms
This course is the exploration of an analytical framework for method selection and model building to help students develop professional capability in data-based techniques of data analytics. A focus will be placed on comparing and selecting appropriate methodology to conduct advanced statistical analysis and on building predictive modeling in order to create a competitive advantage in business operations with efficient analytical methods and data modeling.

BSMM-8750. Predictive Modeling and Decision-Making (Capstone)
This is a project-based capstone course for the Business Data Analytics field. It is a research seminar that adopts an integrative perspective to examine major concepts and important contemporary problems in data management and analytics. Students will use a software/modelling method chosen for data management (e.g., R or Python) to practice skills learned in class on data preparation, analysis, and predictive modeling to improve decision- making quality in a turbulent business environment, with a focus on portfolio and asset management, e.g. FinTech, financial assets pricing and management. Projects also include working with faculty on existing problems facing various industries

BSMM-8990. Co-op Work Term I
Supervised experience in an approved, paid, full-time (minimum 420 hours) career-related setting with a focus on the application of theory and the development of transferable skills. The co-op work experience is designed to provide students with an enriched learning opportunity to integrate academic theory and concepts in an applied setting. Once a placement has been confirmed the student must remain in the co-op program until they have completed their work term requirements. Students that fail to complete their work term requirements per the work term course outline will receive a non-pass on their academic transcript for the work term and may be required to withdraw from co-op. (Prerequisite: Students must be enrolled in a co-operative education program. Offered on a pass/non-pass basis).

MANAGEMENT AND LABOUR STUDIES (MGMT-)

MGMT-8030. Performance Management and Governance
This course develops students' ability to mobilize knowledge from various subject areas such as strategy, governance, risk management, management accounting and control to analyze, evaluate and improve overall organizational performance. This course will facilitate the development of technical and enabling skills required to prepare students for the changing role of professional accountants in organizations who

are both strategic and financial leaders. (Credit may not be obtained for both ACCT-8030 and MGMT-8030.)

MGMT-8130.Leadership and Organizational Change
Provides an analytical framework to understand organizational transformation through (a) leadership and vision building, (b) strategic human resources planning (c) restructuring and redesigning and (d) organization environment interactions. Students will focus on the practical aspects of diagnosing the need for change and supporting, facilitating, or leading the change process.

MGMT-8430.International Management
Focuses on the problems and issues that confront managers in the area of international business. Background materials, cases, and exercises will involve the students in the challenges facing the international manager. A major objective is to develop a sensitivity that will enhance the student's ability to operate in the complex environment of multicultural businesses.

MGMT-8460.Business Negotiation and Problem Solving
Highlights the role of effective negotiation for resolving conflict and sharing resources and power in complex organizations. Students will be exposed to various styles of negotiating, problem solving and bargaining strategies as well as communication approaches aimed at enhancing organizational performance.

MGMT-8470. Managing Diversity in Workplace
Addresses the dynamics of increasing diversity of the work force and the major challenges faced by organizations and their managers such as maintaining fairness and justice, making effective decisions for performance improvement, allowing flexibility and managing diversity in the global environment. The course also analyzes the legal frameworks in place which value and protect employee and employer rights related to gender, race, age, religion, sexual orientation, ability, and other dimensions of diversity.

MGMT-8480.Topics in Management and Labour Studies
A reading and research seminar which deals with major concepts and important current problems in the areas covered by Management and Labour Studies. The precise topic to be covered in a particular term will vary according to current interest and faculty availability and will be announced in the previous term.

MGMT-8600. Business Ethics and Sustainability
Students will critically examine existing structures, organizations, society, and perhaps, most importantly, themselves to see if these represent a means to freedom or domination, liberation or oppression, or some combination of both. Students will study the connection between our dominant paradigm of wealth maximization, social inequality, and environmental degradation. Through the use of experiential learning the course provides an opportunity for students to plan and implement informed and responsible action to improve current global systems within which business is conducted.

FACULTY OF EDUCATION

PROGRAMS

Master of Education (MEd)

An online MEd is available for candidates wishing to pursue the course-based Curriculum Studies or Education Administration Concentrations. Candidates in the online MEd may switch between these two concentrations, complete up to two courses in a face-to-face manner, participate on a part-time or full-time basis, and change to the face-to-face program at any point prior to the start of the associated research projects if they wish to switch from the course-based completion stream to a major research paper or thesis stream.

Admission Requirements

1. In addition to the requirements set forth in the section titled Application Information and the section titled, the Admission Requirements for the Master's Degree, for admission to the Faculty of Graduate Studies, and to programs leading to a Master's degree, applicants to the Master of Education program must:
   (a) present an undergraduate degree from an approved university with standing in the 70% range overall and at least 70% average in the final two years of study;
   (b) submit a "Statement of Personal Objectives" outlining the applicant's professional background and reasons for seeking a graduate degree in education.
2. Applicants who do not identify their area of studies with the K-12 educational system may present alternatives, although the following items are considered to be assets:
   (a) present a Bachelor of Education degree with standing in the 70% range or the equivalent professional preparation.
   (b) have at least one year of successful professional experience in education. In exceptional cases, consideration may be given to applicants who do not possess a Bachelor of Education degree or equivalent, but who: hold an honours Bachelor's degree or the equivalent with standing in the 70% range overall and at least a 70% standing in the last two years; and, can demonstrate experience, interests, and motivation that make them appropriate applicants to the program.

In addition to the Policy on English Language Proficiency Requirements for the Master of Education students will need a minimum score of 7.0 on the International English Language Testing Systems (IELTS) – Academic or Online – with no more than a single band below 7. That one band will have a minimum of 6.5.

Applicants who do not have at least one year of successful professional experience may be considered if they hold an honours Bachelor’s degree or the equivalent with standing in the 70% range overall and at least 70% average in the final two years of study.

3. Advanced Standing: Applicants may be granted credit for up to two graduate term courses completed before application to the Master of Education program and taken in another program at the University of Windsor or at another accredited institution. Requests for advanced standing will be considered only at the time of application and only for graduate courses completed with at least 70% average. The Faculty will not grant credit for any course taken more than seven years before all the requirements for the degree have been fulfilled.

4. Admission to the Master of Education program is to the II Master's Candidate level.

Master of Education (MEd) Degree Requirements

Candidates for the Master of Education degree will pursue studies in one of the following areas of concentration:

1. Curriculum Studies
2. Educational Administration and Leadership
3. Second Language Acquisition, Culture, and Society

Candidates in the thesis and major paper streams are required to successfully complete the following courses:
(a) Three compulsory courses: EDUC-8002. Statistics in Education, EDUC-8001. Research in Education, , and (EDUC-8004. Fundamentals of Curriculum Theory and Development or, EDUC-8005. Theories of Educational Administration and Leadership or, EDUC-8006. Theories and Approaches in Language Acquisition and Instruction, depending on the area of concentration.

Candidates in the Second Language Acquisition, Culture and Society concentration are additionally required to complete two of the following four courses:
EDUC-8400. Language Culture and Society
EDUC-8420. Language Systems Analysis),
EDUC-8430. Special Education and Language Acquisition
EDUC-8910. (32) Language Assessment

It is important to note that with regard to these four courses, SLACS candidates are encouraged to take, as available, the two remaining courses not taken as compulsory courses as additional courses for this concentration.

(b) A research project resulting in either a major paper (EDUC-8960), with the value of two term courses, or a thesis (EDUC-8970), with the value of four term courses;

(c) For Curriculum Studies and Educational Administration and Leadership candidates proceeding to the degree by major paper, five additional courses, at least three of which must be chosen from the courses listed for the area of concentration.

For Second Language Acquisition, Culture, and Society candidates proceeding to the degree by major paper, three additional courses, at least two of which must be chosen from the courses listed for the area of concentration.

(d) For Curriculum Studies and Educational Administration and Leadership candidates proceeding to the degree by thesis, three additional courses, two of which must be selected from the courses listed for the area of concentration. For SLACS candidates proceeding to the degree by thesis, one additional course which must be chosen from the courses listed for the area of concentration.

*Students in the Thesis stream are required to submit a thesis proposal to their Supervisor and Internal Reader for approval prior to starting the thesis. (Before registering for the Thesis Proposal (EDUC-8940), students must have completed all required courses in their program. The Thesis Proposal may be completed concurrently with one course in the final semester of coursework. Thesis stream students must enrol in EDUC-8940 (Thesis Proposal) and do so for each subsequent term until the thesis proposal has successfully been defended. Students may enrol concurrently in the Thesis Proposal (EDUC-8940) and the Thesis (EDUC-8970) if all course work is complete. If students register for the Thesis Proposal (EDUC-8940) and the Thesis (EDUC-8970) concurrently, then only upon completion of the thesis proposal

may thesis stream students begin their Thesis. They must enrol in EDUC-8970 (Thesis) for each subsequent term until the successful completion and deposition of the thesis.

Candidates in the course-based stream are required to successfully complete:
(a) three compulsory courses: EDUC-8001. Research in Education, EDUC-8795.Final Project Seminar , and EDUC-8004. Fundamentals of Curriculum Theory and Development or EDUC-8005 (Theories of Educational Administration or EDUC-8006. Theories and Approaches in Language Acquisition and Instruction, depending .on the area of concentration.

Candidates in the Second Language Acquisition, Culture and Society concentration are additionally required to complete two of the following four courses: EDUC-8400. Language Culture and Society, EDUC-8420.Language Systems Analysis, EDUC-8430. Special Education and Language Acquisition, and EDUC-8910 (32). Language Assessment.

It is important to note that with regard to these four courses, Second Language Acquisition, Culture, and Society candidates are encouraged to take, as available, the two remaining courses not taken as compulsory courses as part of the Electives list specified for this concentration.

(b) For Curriculum Studies and Educational Administration and Leadership candidates seven additional courses, at least four of which must be chosen from the courses listed for the area of concentration.

For Second Language Acquisition, Culture, and Society candidates five additional courses, at least two of which must be chosen from the courses listed for the area of concentration.

STUDIES IN THE AREA OF CONCENTRATION
Compulsory Courses
EDUC-8002. Statistics in Education[5]
EDUC-8004. Fundamentals of Curriculum Theory and Development[1]
EDUC-8001. Research in Education
EDUC-8005. Theories of Educational Administration and Leadership[2]
EDUC-8006. Theories and Approaches in Language Acquisition and Instruction[4]

Two of the following four courses:
EDUC-8400. Language Culture and Society
EDUC-8420. Language Systems Analysis),
EDUC-8430. Special Education and Language Acquisition
EDUC-8910. (32) Language Assessment[4]

EDUC-8940. Thesis Proposal[3]
EDUC-8795. Final Project Seminar[3]
EDUC-8960. Major Paper[3]
EDUC-8970. Thesis[3] (Note: Students in the Thesis stream must have successfully completed the Thesis Proposal (EDUC-8940) before work may begin on the Thesis.)

[1] Compulsory for students in Curriculum Studies.
[2]Compulsory for students in Educational Administration and Leadership
[3]All students must complete either a Final Project, a Major Paper or a Thesis.
[4]Compulsory for students in Second Language Acquisition, Culture and Society
[5]Compulsory for students in the thesis and major paper streams

Language, Acquisition, Culture and Society

EDUC-8001. Research in Education
EDUC-8002. Statistics in Education
EDUC-8003. Qualitative Methods in Educational Research
EDUC-8004. Fundamentals of Curriculum Theories and Development
EDUC-8006. Theories and Approaches in Language Acquisition and Instruction
EDUC-8150. Comparative and International Education
EDUC-8330. Survey Design and Research
EDUC-8340. Individual Reading
EDUC-8400. Language Culture and Society
EDUC-8420. Language Systems Analysis
EDUC-8430. Special Education and Language Acquisition
EDUC-8500. Issues in Education
EDUC-8510. Information and Communication Technologies (ICT) for Teaching and Learning
EDUC-8560. Approaches to Literacy Development
EDUC-8570. The English Language Arts
EDUC-8650. Sociological Aspects of Education
EDUC-8910 (32). Language Assessment

Educational Administration and Leadership
EDUC-8005. Theories of Educational Administration and Leadership
EDUC-8002. Statistics in Education
EDUC-8003. Qualitative Methods in Educational Research
EDUC-8150. Comparative and International Education
EDUC-8310. Supervision of the Instructional Process
EDUC-8320. Administration and Leadership of the School
EDUC-8330. Survey Design and Research
EDUC-8340. Individual Reading
EDUC-8350. Organizational Behaviour in Educational Institutions
EDUC-8360. Introduction to Educational Policy Analysis
EDUC-8380. The Arts and Education
EDUC-8450. Teaching for Sustainability: An Introduction to Environmental Education
EDUC-8500. Issues in Education
EDUC-8510. Information and Communication Technologies (ICT) for Teaching and Learning
EDUC-8550 Strategies for the implementation of Change
EDUC-8560. Approaches to Literacy Development
EDUC-8580. Psychology of Learning Problems
EDUC-8590. The Recent History of Education in Ontario
EDUC-8600. Politics of Education
EDUC-8610. Legal Aspects of Education
EDUC-8620. Educational Finance
EDUC-8650. Sociological Aspects of Education
EDUC-8660. Interpersonal Relationships in Education
EDUC-8910. Special Topics in Education

Curriculum Studies
EDUC-8030. The Psychology of Learning and Teaching
EDUC-8002. Statistics in Education
EDUC-8003. Qualitative Methods in Educational Research
EDUC-8004. Fundamentals of Curriculum Theory and Development
EDUC-8006. Theories and Approaches in Language Acquisition and Instruction
EDUC-8150. Comparative and International Education

EDUC-8330. Survey Design and Research
EDUC-8340. Individual Reading
EDUC-8370. Language Arts in the Elementary School
EDUC-8380. The Arts and Education
EDUC-8410. The Social Sciences Curriculum
EDUC-8450. Teaching for Sustainability: An Introduction to Environmental Education
EDUC-8470. Learning in Science
EDUC-8500. Issues in Education
EDUC-8510. Information and Communication Technologies (ICT) for Teaching and Learning
EDUC-8520. Curriculum Developments in Mathematics Education
EDUC-8530. The Teaching and Learning of Mathematics
EDUC-8540. Fundamentals of Instructional Design
EDUC-8550 Strategies for the implementation of Change
EDUC-8560. Approaches to Literacy Development
EDUC-8570. The English Language Arts
EDUC-8580. Psychology of Learning Problems
EDUC-8650. Sociological Aspects of Education
EDUC-8720. Theory and Practice in Early Childhood Education
EDUC-8910. Special Topics in Education

PhD in Educational Studies (PhD) (Joint Program with Brock, Lakehead and Windsor)

The Joint PhD in Educational Studies is offered jointly by Brock University, Lakehead University, and the University of Windsor. The designation of "home university" is applied to the home university of the doctoral candidate's dissertation supervisor. The student has the right to take courses and seminars or to use the academic facilities at any of the participating universities in accordance with the approved plan.

The regulations governing the preparation of theses and conduct of examinations will be those of the supervisor's home university.

The degree requirements, regulations, and procedures for the Joint PhD. program have been approved by the appropriate governing body of each institution. Where there is a conflict in regulations and procedures:

(a)in academic matters, the regulations of the institution offering the course will prevail.
(b)in non-academic matters, the regulations of the institution at which the student is registered will prevail.

PROGRAM GOALS AND OBJECTIVES

The joint program will accomplish the following goals:
1. provide greater access to advanced study in education for qualified candidates across a wider geographic range in the province;
2. promote the growth of research activity and professional development through collaboration among practitioners, scholars, educational institutions, and Faculties of Education;
3. foster inter-university links and promote partnerships among Ontario universities;
4. further the expansion of research culture and service throughout the province; and
5. contribute to the renewal of the professoriate and educational leadership in Ontario during the upcoming period of heavy retirement in the universities and school systems.

The objectives of the program are to produce graduate students who will:
1. contribute to the development of knowledge and expertise in teaching/ learning at all levels on the education continuum.
2. contribute to the solution of problems/issues in Canadian education.
3. promote scholarly enquiry and the development of methodological advances in the study of education.
4. integrate theory and practice in education; and,
5. assume positions of leadership in Faculties of Education, school systems, and other public- and private-sector institutions concerned with education.

Admission Requirements
Normally, the minimum academic requirement for admission to the PhD is successful completion of a Master of Education or Master of Arts in Education with an A standing.

In exceptional circumstances, applicants with lower formal academic qualifications but with a strong track record of professional experience related to the proposed area of doctoral study may be admitted. In these cases, however, the Admissions Committee may place additional requirements upon the applicant. Additional requirements will be stated on the offer of admission.

Applicants must provide evidence of research competence normally demonstrated by a master's thesis.

English is the primary language of communication and instruction in the program. Applicants from other countries who have not completed a degree at a university where the primary language of instruction is English must pass the Test of English as a Foreign Language (TOEFL) with a minimum score of 600 (250 computer-based) or an equivalent demonstration of proficiency. Candidates who are working on the degree at a distance from the home university must purchase the software and access to the internet which will enable them to participate fully in the required courses.

Admission and Advanced Standing
Students may receive advance credit for a maximum of one-half course specialization at the graduate level provided that this course has not been credited to a degree or certificate already awarded, is relevant to the proposed area of study and has been taken within three years of admission. Requests for advanced credit must be declared prior to admission. No substitution may be made for Core Seminars I and II or the Joint Specialization course via distance education.

Research Plan
Applicants must submit a description of their proposed area of research (approximately 2-3 typed pages). When an applicant meets the basic requirements for admission, the potential supervisor and/or the Program Director will assist the applicant in developing a plan of study which will be presented to the Program Committee for approval. If approved, the applicant will proceed to register as a doctoral student at the home university of the dissertation supervisor and will be subject to the general degree regulations of that university. The offer of admission will be made to the applicant by the home university.

Dissertation supervisors will be required to report candidates' progress annually to the Program Committee and to appropriate authorities at the participating universities. Normally, candidates will be expected to complete course requirements and the comprehensive portfolio, and to submit a research proposal within three years of their initial registration. Changes to the approved plan of study must be approved in advance by the Program Director in consultation with the candidate and the supervisor.

Fields of Study

1. Cognition and Learning: Cognition and learning draws primarily upon cognitive, developmental, social, and educational psychology as well as science and technology, to examine critically the cognitive, behavioural, emotional, and social processes of educators and students as they engage in teaching and learning. Integral components of this field include, but are not limited to, issues concerning best practices, remedial and contemporary instruction, assessment and evaluation, professional development, curriculum development and implementation, metacognition, and learning theories.

2. Educational Leadership and Policy Studies: This field of study encompasses a range of humanities and social science disciplines to explore the morale, social, and cultural purposes of educational organizations, policy, and leadership. It draws upon the works of key scholars in organizational, administrative and policy studies to articulate the philosophical, theoretical and methodological frameworks that inform scholarship and practice. These frameworks situate the major issues and debates confronting educational systems within their larger socio-political and socio-cultural contexts.

3. Social/Cultural/Political Contexts of Education: Education occurs in a dynamic, complex, and contested milieu. The Social/Cultural/Political Contexts of Education field of study critically explores the interplay between culture and education from caried historical, philosophical, and theoretical perspectives with the intent of fostering emancipatory research and democratic practice. Consideration is given but not limited to social constructs of race, class, gender, sexuality, and ability/disability, and how they intersect and influence educational experiences.

Applicants to the program must declare a field of study prior to admission to the program.Doctoral candidates must be familiar with the academic regulations governing graduate studies at the home university.

Degree Requirements
EDUC-9020. Doctoral Seminar I
EDUC-9040. Doctoral Seminar II

EDUC-9510. The Specialized course. (Candidates may meet this requirement through a graduate level course offered at any of the participating institutions)

One Joint PhD. Specialization course:
EDUC-9210. Educational Leadership and Policy Studies
EDUC-9310. Socio/Cultural/Political Contexts of Education
EDUC-9410. Cognition and Learning

EDUC-9690. Research Proposal Colloquium (via distance education) (Prerequisite: must have completed two terms of full-time residency or equivalent.)

Comprehensive Portfolio
The Comprehensive Portfolio (EDUC-9800) requires doctoral candidates to demonstrate their potential as scholars through the satisfactory completion of authentic tasks.

The criteria used by the dissertation supervisory committee to set tasks and assess a candidate's performance are:
(a) an understanding of the concepts, theories, and issues in the field of study;
(b) a knowledge of current literature and research methods in the field of study;
(c) the ability to analyze and synthesize current literature on a specific problem within the field of study;
(d) an understanding of and ability to critique research in the field of study and research paradigms.

The tasks candidates are expected to complete include the dissertation research proposal, and three other tasks. Candidates must defend their portfolios.

The candidate's defence will be evaluated by the dissertation supervisory committee and at least one other member of the core faculty selected by the Program Director. Candidates are required to present their completed portfolio to an audience in a forum such as the Core Seminar.

Candidates may not begin their dissertation research until the portfolio requirements have been completed successfully.

Dissertation
The Dissertation supervisory committee will involve faculty from at least two participating universities, including whenever possible and reasonable, a member from the university closest to the candidate's home to serve as co-supervisor in cases where the supervisor is at some distance. The regulations and procedures governing the preparation of theses and conduct of examinations will be those of the supervisor's university.

Residence
Candidates are required to maintain continuous registration. They shall complete the requirements for the degree within a minimum of three years and a maximum of six years.

Recommendations for a time extension or leave of absence are subject to the regulations and procedures at the home university and must be approved in advance by the supervisor and the Joint Program Committee.

Doctoral Courses:

Core Seminars
EDUC-9020. Doctoral Seminar I: Research, Theories, and Issues
EDUC-9040. Doctoral Seminar II: Research, Theories, and Issues

Specialization Courses

Policy and Leadership
EDUC-9210. Educational Leadership and Policy Studies
EDUC-9310. Socio/Cultural/Political Contexts of Education
EDUC-9410. Cognition and Learning

Other Required Courses
EDUC-9510. The Specialized Course
EDUC-9690. Research Proposal Colloquium
EDUC-9800. Comprehensive Portfolio
EDUC-9980. Doctoral Dissertation

EDUCATION COURSES (EDUC-)

Not all courses will necessarily be offered each year. All 900-level courses are restricted to students in the joint Ph.D. program.

EDUC-8001. Research in Education
An overview of educational research methods: e.g., the interpretation of research literature, the identification and use of data bases, the design of research proposals and the application of specific methods to research projects.

EDUC-8002. Statistics in Education
This course will deal with the following: descriptive and inferential statistical procedures; commonly used one- and two-sample tests; an introduction to analysis variance and corresponding research designs. (Prerequisite: EDUC-8001)

EDUC-8003. Qualitative Methods in Educational Research
This course will examine the concepts and methods involved in carrying out educational research through naturalistic observation, participant observation, case studies, and other qualitative approaches. (Prerequisite: EDUC-8001)

EDUC-8004. Fundamentals of Curriculum Theory and Development
A survey of the major theories of curriculum that have influenced education. An outline of the techniques employed in curriculum development, including sources of influence and control, specification of outcomes, selection and coordination of activities, strategies, resources and evaluation.

EDUC-8005. Theories of Educational Administration and Leadership
This course will examine current knowledge in educational administration. Theory, research, and the practice of leadership within the educational system will be the main foci. Emphasis will be placed on administrative problems, such as staff development, team building, and motivation.

EDUC-8006. Theories and Approaches in Language Acquisition and Instruction
This course reviews current thinking on the nature of language, communication and second-language learning and examines implications for teaching methods and curriculum design.

EDUC-8020. Learning-Centred Teaching in Higher Education: Principles and Practice
This course offers the opportunity to explore, apply, and evaluate principles and theories of learning-centred practice in contexts typical of higher education. Analysis and reflection on teaching practice constitutes a central theme of learning in the course. The course is of particular interest to teaching assistants and members of the professoriate from across the disciplines and professional fields, but prior teaching experience in higher education is not a prerequisite.

EDUC-8030. The Psychology of Learning and Teaching
This course will provide students with an in-depth view of psychological theory and research towards the understanding of learning and teaching. While both behavioural and cognitive perspectives will be discussed, the emphasis will be upon cognitive theory and application. Topics will include behaviourism, behaviour modification, information processing, metacognition, cognitive behaviour modification, cognitive strategy training, motivation and individual differences.

EDUC-8150. Comparative and International Education
The course is designed to introduce students, who are registered in both the Educational Administration and Leadership and Curriculum stream of the MEd program, to important educational issues from a

comparative and international perspective. Within this framework, the similarities and differences between Canadian education and educational practices in other countries of the world are examined. Key questions that guide the direction of the course include, although are not limited to the following: what can we learn from the educational, teaching and learning practices of other countries? What are the processes involved in educational policy formulation from an international perspective? What are the emerging global trends in education and how does globalization impact on education and teaching/learning practices in Canada? In addition, various international frameworks for promoting peaceful educational/school environments such as peace education, global, and intercultural education are explored. The local, national and global impact of the educational policies of international agencies such as the UN, UNESCO, the World Bank, and CIDA are also analyzed.

EDUC-8310. Supervision of the Instructional Process
A practice-oriented course designed to develop administrative competency in the supervision of instruction. The focus will be threefold: (1) awareness and recognition of specific technical skills, (2) the development of competence in interpersonal and group skills, and (3) a general examination of supervisory approaches.

EDUC-8320. Administration and Leadership of the School
This course will consider and analyze the many variables impacting upon school administrators as they organize their schools. The effects of administrative theory, past and present, will be considered.

EDUC-8330. Survey Design and Research
This course will provide students with an overview of survey research and questionnaire design. Students will critique existing survey research, develop a working knowledge of survey research design, critique samples of survey questionnaires, and design a questionnaire based on a chosen research topic. (Prerequisite: EDUC-8001)

EDUC-8340. Individual Reading
The Individual Reading course is intended to permit students with special interests in, and knowledge of, particular areas of education not covered in sufficient depth in available courses to pursue those interests through independent, supervised study. (Permission of an advisor and of a subcommittee of the Graduate Studies Committee is required.)

EDUC-8350. Organizational Behaviour in Educational Institutions
A study of theory and research in the socio-behavioral sciences which concerns the behaviour of individuals and groups in educational settings. Attention will be given to the implications of such theory and research for administration in educational institutions.

EDUC-8360. Introduction to Educational Policy Analysis
This course focuses on a critical and disciplined examination of education policy issues drawing on a variety of theoretical orientations such as positivist, pluralist, post-positivist, poststructuralist and others. These perspectives provide different lenses to view current and past education reform and restructuring policies in Ontario and other jurisdictions in Canada, Australia, New Zealand, Finland, U.S.A, and the U.K. It reviews current theoretical approaches to the nature, development, and implementation of educational policy at all levels. The course critiques policy-makers' approaches to reform, and restructuring, and the potential short- and long-term impacts of these changes on the philosophy, content and practices in the public education arena. By thinking about what sort of people and voices inhabit the texts of policy, the course enables participants to think about how we engage with the social and collective identities of our research subjects in an attempt to capture the complex interplay of identities and interests, and coalitions, conflicts and uneasy 'settlements' within the processes and enactments of policy.

EDUC-8370. Language Arts in the Elementary School
This course will examine issues in language arts instruction in the light of current language theories. The focus is on current research and its practical application, with special emphasis on methods of instruction, teacher strategies, student activities and evaluation practices.

EDUC-8380. The Arts and Education
This course explores how the arts influence the construction of meaning in society, both within and beyond the classroom. Representation, through images, music, and text, traditionally serve to preserve cultural memory, but can also reflect changing social mores, challenge established ideas, and trigger new ways of thinking. Readings will include current research in the arts and education, and class activities will include the production and interpretation of images and artefacts.

EDUC-8400. Language, Culture, and Society
The New London Group (1996, 2000), an international group of literacy experts, coined the term "multiliteracies." In their manifesto, they suggested that literacy needs to focus on ensuring that people of diverse linguistic and cultural backgrounds be able to integrate in all societies without losing what is unique to their identities, and for accents and dialects to be recognized as a part of the English language (that there is no one true standard English). It is a matter of equity that we find genuine ways to embrace diversity. The other thrust of the New London Group's theory is that multiliteracies provide a better way to define literacy because it acknowledges the role that technologies, multimodalities, semiotics, and media play in literacy and how meaning is constructed and communicated. A multiliteracies theoretical framework has implications for systemic as well as individual changes in both schools and broader societies. This course will trace some of the historical roots of multiliteracies in critical theory as well as analyze how multiliteracies are developing in practical and theoretical terms in the current world.

EDUC-8410. The Social Science Curriculum
An examination of trends and development of social science curricula. Curriculum theory will be applied to one or more of the social sciences within the context of provincial guidelines and the academic and professional qualifications of the students.

EDUC-8420. Language System Analysis
This course is a broad introduction to the analytic study of human languages. It surveys language systems such as: phonology, morphology, syntax, semantics, and pragmatics. It explains how those systems interact with each other synchronically in discourse and diachronically in creating language families. Students have an opportunity to examine the universal features of all languages and their relationship to linguistic variety. Topics in historical linguistics, sociolinguistics, psycholinguistics, and neurolinguistics are explored. Various writing systems used in world languages are also discussed.

EDUC-8430. Special Education and Language Acquisition
The relationship between language acquisition, perceived learning dis/abilities, and special education support has been the subject of ongoing debate. Key topics linked to this debate include: language impairment, needs assessment, access to support, method of support, program design, and disproportional representation. These matters have significant implications for language learners, educators, and program developers alike. Those involved in teaching-learning an additional language, whatever that language might be, face a number of important questions, including: What is language impairment? How should the needs of language learners be assessed? Who should access support? What should that support look like? What should inclusion look like in a language learning setting? Why have language learners been disproportionally represented in some special education programs? As these questions indicate, language learning is complicated, and is intertwined with a number of social justice issues. In this course, students will critically examine a range of current research, and draw

conclusions about the discourse on the relationship between language acquisition, perceived learning dis/abilities, and special education support.

EDUC-8450. Teaching for Sustainability: An Introduction to Environmental Education
This course will engage students in an analysis and investigation of the philosophical and pedagogical underpinnings of EE, and the pragmatic relevance of learning for sustainability. To this end students will get an opportunity to critically discuss, analyze, and evaluate a variety of perspectives around the environmental debate and assist them in articulating, clarifying, and/or refining their own assumptions and position about the environment and implications for sustainability. Fundamental questions to be answered include, what is the rationale for teaching and learning for sustainability and what are the core principles and competencies that should drive this pursuit? Secondly, what pedagogical constructs are useful in effective teaching and learning for sustainability? Students will engage in investigations of real world environmental issues, and problem-solving, and experiential learning through field-trips.

EDUC-8470. Learning in Science
This course will consider current research and theory in the promotion of science as a process and product. Included will be a critical survey of recent issues in science education. The focus will be on their implications for curriculum and practice at the classroom level. An examination of some of the major difficulties in the design, development, implementation, and evaluation of science curricula.

EDUC-8500. Issues in Education
This course will examine current issues affecting contemporary Canadian education. Specific course content and instructors will be published in advance.

EDUC-8510. Information and Communication Technologies (ICT) for Teaching and Learning
This course explores how Information and Communication Technologies (ICT) can support teaching and learning within an educational context. It analyzes principles, strategies and related issues regarding the design of innovative educational technologies and creative learning environments. This course will include discussions based on assigned readings as well as hands-on learning activities. Students will gain an understanding of how various Information and Communication Technologies (ICT) enhance a student-centered approach to learning.

EDUC-8520. Curriculum Developments in Mathematics Education
This course will examine recent developments in curriculum, instruction, and evaluation in elementary and secondary mathematics education. Trends will be discussed in light of recent research findings, technological advances, and social goals. International comparisons will be made.

EDUC-8530. The Teaching and Learning of Mathematics
This course will examine research into students' learning and the teaching of mathematics. First, the motivational aspects of teaching and learning will be considered, including those related to the topic "Women in Mathematics." Second, specific mathematical topics will be dealt with, selected according to the interests of students.

EDUC-8540. Fundamentals of Instructional Design
This course will consider current principles, research, theory and practice in the design, development, implementation and evaluation of instruction within various learning and teaching settings.

EDUC-8550. Strategies for the Implementation of Change in Education
Procedures for dissemination, adoption, implementation, and integration of changes for teachers, administrators, and leaders of professional organizations. Attention will be given to theoretical models and their applications, change agency, and modification of organizational climate and structure.

EDUC-8560. Approaches to Literacy Development
This course will consider current research and theory in the development of reading and writing abilities, and will examine some aspects of assessing literacy development.

EDUC-8570. The English Language Arts
This course will examine current theories and issues in the English Language Arts with particular focus on their implications for curriculum and practice in the intermediate and senior divisions. Current issues at the local or provincial level, determined by the group, may be examined in detail.

EDUC-8580. Psychology of Learning Problems
This course will review current theories of learning disabilities and learning problems. Various approaches to diagnosis and remediation will be presented. Students will be expected to discuss case study examples during the course, and to develop a particular interest area to great depth.

EDUC-8590. The Recent History of Education in Ontario
This course examines major developments in Ontario education from the 1950s to the present day. Beginning with the postwar Hope Commission Report, and extending to the current attempts at reform, the Ontario school system for primary and secondary education has undergone a series of dramatic changes over the past half century. These changes will be investigated in the context of their historical evolution, and contemporary relevance.

EDUC-8600. Politics of Education
This course will examine the administration of education from a political perspective. Both the legal and extra-legal factors that influence educational outcomes will be examined. Their roles will be viewed in terms of comparative forms of educational administration. Finally, several administrative decisions will be analyzed using the perspectives gained throughout the course.

EDUC-8610. Legal Aspects of Education
This course will focus on legislation and court decisions dealing specifically with the educational process. Both the historical and philosophical basis of these and the practical application of the same in a contemporary setting will form the primary emphasis for the course.

EDUC-8620. Educational Finance
This course will be concerned with educational finance in Canada, with particular emphasis on Ontario. It will examine such topics as equity, accountability, efficiency, and adequacy of educational revenues and expenditures. Provincial grant systems will be analyzed within the contexts of political governance and the economics of education.

EDUC-8650. Sociological Aspects of Education
This course will examine the school and its occupants and their relationship to the contemporary social order. Analysis of topics such as student culture, learning and social class, roles within the school setting will occur. The focus will be on theoretical positions, representative research findings and representative research methods.

EDUC-8660. Interpersonal Relationships in Education
This course will analyze the importance and dynamics of interpersonal behaviour. Students will be given the opportunity to examine and develop their own skills in this area. Emphasis will also be placed upon a practical orientation toward utilizing these skills in the educational environment.

EDUC-8720. Theory and Practice in Early Childhood Education
An examination of theory and current practice in Early Childhood Education. The emphasis will be on the translation of theory into sound educational practice. Organization and management of Early Childhood programs will be of concern as well as teaching procedures.

EDUC-8795. Final Project Seminar
Candidates pursing the course-based option, under the guidance of the instructor and in consultation with other faculty where appropriate, will engage in a collaborative process leading to the production of a final project on an issue or topic of inquiry of relevance to professional practice. The final project will be grounded in relevant research and show evidence of knowledge, skills of inquiry, reflection and problem-solving acquired through the other courses. It will normally be taken following completion of the other course-work.

EDUC-8910. Special Topics in Education
Selected advanced topics in Education based on new developments in particular areas, special faculty interests, and opportunities afforded by the availability of visiting professors. Special topics are subject to Graduate Committee approval and may be taken more than once provided the topics are different.

EDUC-8910. Special Topics in Education - Topic: Language Assessment
This course introduces participants to international principles and practice of assessing language ability and engages participants in the debate on how to measure language fluency. A variety of national and global methods of language assessment will be critically discussed in this course. Participants will also compare and evaluate research that explores this subject as they justify their own analyses of language assessment research.

EDUC-8930. Educational Research Internship
Candidates pursuing the Master of Education, under the guidance of a course instructor, field experience coordinator, and/or research partners in the field, will engage in a collaborative process leading to the production of a final paper on an issue or topic of inquiry of relevance to the research partners in the educational field. This course will present students with authentic assessment tasks that situates their on-going inquiries in a context that enables them to apply and further critique what has been learned previously. Students will engage in matters pertaining to research, program review, policy development, and so on, as appropriate. The spectrum of projects may, for example, address questions aimed at the improvement of literacy and numeracy skills, student motivation, curriculum integration, and leadership development. The final assessment will be grounded in relevant research and show evidence of knowledge, skills of inquiry, reflection and problem-solving acquired through the other courses. It will normally be taken following completion of the other coursework. (Prerequisites: EDUC-8001).

EDUC-8940. Thesis Proposal
Candidates pursuing a Master's thesis, under the guidance of the thesis supervisor, internal thesis reader, and other faculty where appropriate, will engage in the preparation and defence of a Masters thesis proposal. (Before registering for the Thesis Proposal (EDUC-8940), students must have completed all required courses in their program. The Thesis Proposal may be completed concurrently with one elective in the final semester of coursework.) Thesis stream students must enrol in EDUC-8940 (Thesis Proposal) and do so for each subsequent term until the thesis proposal has successfully been defended.

EDUC-8960. Major Paper
Conducted under the guidance of at least two members of the Faculty, a major paper may analyze and evaluate a substantial body of scholarly literature or describe or interpret a research project undertaken by the student. The major paper is subject to an oral examination (see section titled, The Master's Degree

- Thesis or Major Paper, and the section titled Education - The Master of Education Degree - Program Requirements.)

EDUC-8970. Thesis
Students may enrol concurrently in the Thesis Proposal (EDUC-8940) and the Thesis (EDUC-8970) if all course work is complete. If students register for the Thesis Proposal (EDUC-8940) and the Thesis (EDUC-8970) concurrently, then only upon completion of the thesis proposal may thesis stream students begin their Thesis. They must enrol in EDUC-8970 (Thesis) for each subsequent term until the successful completion and deposition of the thesis.

EDUC-9020. Doctoral Seminar I
In Core Seminar 1, the history and philosophical foundations of education are examined through the three fields of study. As well, students are introduced to qualitative methods of research in education, encompassing interview, phenomenological, ethnographic, constructivist, and case study approaches to data collection, analysis, and interpretation.

EDUC-9040. Doctoral Seminar 2
In Core Seminar 2 students examine research, theories, and issues in the fields of study via a specific theme which is identified annually. For example, the theme might be bullying, or caring education, or gender issues. As well, students are introduced to quantitative methods of research in education, encompassing true experiments, quasi experiments, and correlational studies.

EDUC-9210. Educational Leadership and Policy Studies
This course introduces students to the origins and intellectual traditions of theories that influence how we organize education. Students develop an understanding of sociological paradigms that have influenced educational systems over time, and develop perspectives that enable them to think critically and creatively about contemporary and future issues in educational leadership, policy, and organizations.

EDUC-9310. Socio/Cultural/Political Contexts of Education
This course centres around a critical examination of cultural, historical, and theoretical perspectives in education. Bodies of knowledge related to understanding the complexities of sociocultural influences in education are the main focus. Power relations at play and how they are negotiated in everyday practice are considered. Using the sociocultural framework developed in the course, students also investigate their specific areas of interest (for example, curriculum theory and practice).

EDUC-9410. Cognition and Learning
This course provides an analysis of epistemological theories through a critical examination of foundational and current research and a reflection on historical and philosophical orientations as they relate to contemporary issues in cognition and learning.

EDUC-9510. The Specialized Elective
The content for this course must relate to the student's dissertation topic and field of study. The course may be selected from the graduate studies calendar of courses from one of the participating universities, or it may be taken as a directed study. A directed study takes place under the supervision of a faculty member with appropriate expertise. Usually, the student completes a sustained program of study relating to a topic of current theoretical and/or empirical interest leading to the production of a substantial research paper. Directed studies are intended for students with special interests which cannot be satisfied by calendar courses.

EDUC-9690. Research Proposal Colloquium

In this course students examine theory and research in relation to their intended dissertation topic. Students develop a topic idea in the form of a dissertation proposal, defining a research question and a theoretical base for intended study. Students examine research questions in relation to varied methodologies, so that a diverse examination of research frameworks takes place through WebCT based discourse.

EDUC-9800. Comprehensive Portfolio
(3 course equivalencies.)

EDUC-9980. Doctoral Dissertation
(See section titled, The Degree of Doctor of Philosophy - The Dissertation, and the section titled Education - Joint Doctor of Philosophy in Educational Studies.) (10 course equivalencies.)

FACULTY OF ENGINEERING

PROGRAMS

PhD in Engineering

Doctor of Philosophy (PhD)

PhD program requirements are common for the following Engineering programs: Civil Engineering, Electrical Engineering, Environmental Engineering, Engineering Materials, Mechanical Engineering. The areas of specialization are listed by Department.

Admission Requirements

An applicant for admission to a course of graduate studies leading to the Doctor of Philosophy degree in Engineering must normally be a graduate of a recognized university with a Master's degree in Engineering or Applied Science. Applicants with degrees in related fields will be considered but will normally require strengthening of their background in engineering. At the discretion of the Program Graduate Committee, Graduate Record Examinations (GRE) may be required.

All applicants whose native language is not English are required to satisfy the English proficiency requirement as described in the application procedures listed in this calendar.

Possession of the minimum requirements does not automatically ensure acceptance to the degree program.

Candidacy: Admission to graduate study does not imply admission to candidacy for a degree. The candidacy of a student normally will be determined within the second year after initial registration in the doctoral program.

Candidacy will be granted to students who meet all of the following requirements:
(a) satisfactory completion of the comprehensive examination;
(b)demonstration to the doctoral committee of ability to conduct independent research;
(c)acceptance by the doctoral committee of the research proposal.

The doctoral committee will assess the student's competence to continue research on the basis of (a), (b) and (c), and inform the Chair of the Program Graduate Committee.

Program Requirements

The specific minimum program requirements for the PhD. include the successful completion of:

1. Course Requirements: Satisfactory completion of at least four courses, comprising a minimum of eight term hours, beyond the courses required for the Master's degree.

a. Civil Engineering and Environmental Engineering: Students may take up to two graduate courses outside

the program for credit provided these courses are deemed relevant and approved by the student's supervisor and the Program Graduate Coordinator. Under special circumstances, one of these two courses
may be at the senior undergraduate level. In addition, the students must complete 36 hours of participation in the PhD Seminar, including delivering two presentations in the seminar, by registering in
CIVL 9595 or ENVE 9595, respectively.

b. Students who are unable to complete the Graduate Seminar course may take an additional 3-credit graduate course approved by the Program Graduate Coordinator (or Department Head) to fulfill the credit
requirement for the degree. Other exceptions to the nominal graduate seminar requirements may be approved by the Graduate Coordinator (or Department Head) to allow the graduate student to fulfill the
graduate seminar requirement through alternate means if the current provisions are not feasible. This
request must be supported by the student's supervisor.

2. A comprehensive examination.

3. Satisfactory progress in research within each review period. The doctoral committee will establish by periodic review, which will include at least one formal seminar a year, that adequate progress in research has been accomplished by the candidate. The doctoral committee will also grant permission to write the dissertation when it decides the candidate has achieved sufficient competence in carrying out research, and when the candidate has done substantial research.

4. A dissertation on the research. Each candidate will be required to make an oral presentation of the dissertation research and will be examined orally on the subject of the dissertation and related fields.

Residence and Time Limits: Every student will undertake a full program of study for a minimum of three years beyond the Baccalaureate of Engineering or its equivalent. Credit for one of these years may be given for the time spent in proceeding to a Master's degree. Credit for one of these years may also be given for work done at another institution. However, in no case shall the student spend fewer than two of the three required years of residence in full-time attendance at the University of Windsor.

A student admitted to a PhD. program requiring the student's attendance for a minimum of three years must complete all requirements within seven years. Students admitted to a program requiring a minimum of two years' residence must complete all requirements within six years.

Committees: Research undertaken as part of a doctoral program is normally directed and supervised by a doctoral committee. Whereas the student's advisor provides day-to-day guidance and direction, the committee is ultimately responsible for the overall supervision to ensure that adequate progress is being maintained. The doctoral committee will consist of at least four members, with the student's advisor as chairperson. The advisor must be a member of graduate faculty. At least one member shall be from a program area within the University of Windsor other than the one in which the student is majoring.

The student's advisor will propose the names of members for the doctoral committee, and these will be subject to the approval of the Program Graduate Committee and the Executive Committee of the Faculty of Graduate Studies. Within one month after initial registration, each student will be assigned to a doctoral committee.

The final appraisal of the dissertation and the conduct of the final oral examination of the dissertation will be carried out by an examining committee. The examining committee will consist of the doctoral committee, the Dean of Graduate Studies or designate as chairperson (non-voting), and an external examiner.

Examinations: At the discretion of the doctoral committee a qualifying examination may be required. A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in the major subject; it is designed to test the student's preparation for advanced graduate work. If such an examination is required, it must be administered and passed before the student registers for the second year of PhD. work.

In addition to the usual examinations on course work, all students must meet the following requirements:

1. Review of Progress on Research: Within the first year, the student will present in the form of a seminar an outline of his or her proposed thesis research. This will be presented to the doctoral committee who must approve, with or without modifications, or reject the proposal. Thereafter, at least once a year the student will report his or her progress in the form of a seminar.

2. Comprehensive Examination: Students who have previously obtained a Master's degree must attempt this examination within twelve months of registering for the PhD. program. Other students must take it within twenty-four months of registration for the PhD. program. This set of examinations requires the students to demonstrate an adequate background in the general discipline of engineering, and an advanced knowledge in their fields of specialization.

The comprehensive examination will be conducted by a program comprehensive committee in one or two sections at the discretion of the Program Graduate Committee:

(a) a scheduled, supervised written portion, of at least three hours' duration, designed to test the student's general knowledge on core subjects in the field of study, with questions set and answers evaluated by the program comprehensive committee;
(b)an oral examination to be evaluated by the program comprehensive committee. The objective of this part of the examination is to test the student's ability to integrate general knowledge from different areas of the field of study in order to solve problems the student has not previously encountered.

The student's overall success in the comprehensive examination will be determined by the program comprehensive committee. If the student is unsuccessful, the committee may require:

(a) that the student repeat all or part of the comprehensive examination at a specified time,
(b)that the student take and pass remedial coursework before repeating all or part of the examination, or
(c)after consultation with and approval by the doctoral committee, that the student withdraw from the program.

3. Final Examination: The passing of the final oral examination of the dissertation requires both an adequate dissertation and a satisfactory defence of the dissertation. This examination will be conducted by the examining committee. Following the acceptance and provisional approval of the dissertation by the doctoral committee, and a satisfactory preliminary report from the external examiner, a date for the oral examination can be set. Except under very unusual circumstances, the external examiner must be present at the oral examination. If the examining committee cannot arrive at a unanimous decision to award a passing grade, the majority decision will be accepted provided that there is no more than one dissenting vote. However, if the dissenting vote is that of the external examiner, a new external examiner

may be appointed and another oral examination will be required. If the new examiner also gives a dissenting vote, the dissertation will not be accepted.

Research in Outside Institutions
Research for the PhD or MASc degree, in part or in whole, may be carried out in an outside institution (e.g., industrial, governmental, or academic university). A student who does research at an outside institution must fulfil the same requirements as a student doing on-campus research. The only exception is that the time spent doing the off-campus research relevant to the thesis or dissertation will be credited toward the residence requirement. In addition to the general requirements, a student applying for permission to do research at an outside institution must provide:

1. A detailed statement of the research proposal, including arrangements for supervision, and of the circumstances under which the research is to be carried out.
2. Evidence that the institution has adequate facilities for the research; and that the applicant will be able to pursue independent research.
3. A proposed time schedule.
4. A letter of support from a responsible person in the outside institution giving approval of the proposal and accepting these regulations.

Industrial and Manufacturing Systems Engineering (Multi-Disciplinary PhD)

Program Overview
The objective of the multi-disciplinary PhD. program is to impart multi-disciplinary education and skills in an environment that fosters excellence in research and awareness of the many challenges of modern Industrial and modern Manufacturing Systems. The program will provide students with an opportunity to acquire, through courses, seminars and networking, advanced academic and professional knowledge in the multi-faceted area of industrial and manufacturing systems and related subjects as well as develop basic and applied research skills to become independent research investigators capable of disseminating knowledge and research results through scholarly publications.

The multi-disciplinary PhD. program in Industrial and Manufacturing Systems Engineering is based in, and coordinated by, the Department of Mechanical, Automotive and Materials Engineering, in collaboration with faculty from other Faculties. The participating faculty for the Multi-Disciplinary PhD program in Industrial and Manufacturing Systems Engineering are drawn from several disciplines and departments within the University, namely, Department of Mechanical, Automotive and Materials Engineering, the Faculty of Human Kinetics (Department of Kinesiology), the Odette School of Business, the Faculty of Science (Operational Researchers), Electrical and Computer Engineering Department and the School of Computer Science.

Areas of Specialization
Research within the Industrial and Manufacturing Systems PhD. program focuses on modern manufacturing systems that are flexible and well-integrated. It deals with various modules such as: 1) physical components of the system (machines, robots, inspection devices, material handling equipment, etc.), 2) effective information systems for controlling, monitoring, scheduling and operating in a dynamically changing environment, 3) human related issues such as ergonomics, interaction among people and between people and machines as well as human modeling, 4) management of technologies and operational issues throughout the manufacturing enterprise, and 5) integration of all elements to ensure achieving the desired competitiveness.

Candidacy
Admission to graduate study does not imply admission to candidacy for a degree. The candidacy of a student normally will be determined within the second year after initial registration in the doctoral Program.

Candidacy will be granted to students who meet all of the following requirements:
(a) Satisfactory completion of the comprehensive examination;
(b) Demonstration to the doctoral committee of ability to conduct independent research;
(c) Acceptance by the doctoral committee of the research proposal.

The doctoral committee will assess the student's competence to continue research on the basis of (a), (b) and (c) above, and make a recommendation accordingly to the Dean of the Faculty of Graduate Studies through the Chair of the Graduate Program.

Admission Requirements
The PhD. program in Industrial and Manufacturing Systems Engineering will be governed by the general regulations regarding the PhD. degree of the Faculty of Graduate Studies.

Degree Requirements
(a)The minimum course requirement for the multi-disciplinary PhD Program is 4; at least 2 from the INDE-8XXX courses and a minimum of one from Category B would be selected. This is in addition to the Graduate Seminar course (INDE-8595). Students will be required to register throughout the entire program and give presentations, and all students will be expected to attend each seminar (no less than 75% of all seminars). The course will be graded on a PASS/FAIL basis (1 Lecture Hour a week). This course will include presentations by graduate students, staff, and visiting scientists.

The Category B courses are: (ECON-8XXX, COMP-8XXX, MATH-8XXX, STAT-8XXX, MSCI-8XXX, STEN-8XXX, BUSI-8XXX, ELEC-8XXX, MECH-8XXX, ENVE-8XXX, KINE-8XXX).

(b) A comprehensive examination.

(c) Satisfactory progress in research within each review period. The doctoral committee will conduct a periodic review, which will include at least one formal seminar a year, after the first year of residency, to establish that adequate progress in research has been accomplished by the candidate. The doctoral committee will also grant permission to write the dissertation when it decides that the candidate has achieved sufficient competence in carrying out research and when the candidate has done substantial research. During the annual seminar, PhD. students will be required to review their research progress and results. The PhD. Supervisory Committee will complete the evaluation.

(d) A dissertation on the research. A dissertation embodying the results of an original investigation in the field of specialization is required of all candidates for the degree of Doctor of Philosophy. Each candidate will be required to make an oral presentation of the dissertation research and will be examined orally on the subject of the dissertation and related fields.

Residence and Time Limits: Every student will undertake a full Program of study for a minimum of three years beyond the Baccalaureate of Engineering or its equivalent. Credit for one of these years may be given for the time spent in proceeding to a Master's degree. Credit for one of these years may also be given for work done at another institution. A student admitted to a PhD. Program requiring the student's attendance for a minimum of three years must complete all requirements within seven years. Students requiring a minimum of two years' residence must complete all requirements within six years.

Committees: Research undertaken as part of a doctoral Program is directed and supervised by a doctoral committee, which is assigned within the first term of registration. Whereas the student's advisor provides day to day guidance and direction, this committee is ultimately responsible for the overall supervision to ensure that adequate progress is being maintained.

The doctoral committee will be composed of at least 4 faculty members including:
1) the student's advisor,
2) two other faculty members from within the program, and
3) one internal external faculty member outside the student's department and within the University of Windsor.

The student's advisor will recommend the members of the doctoral committee, whose appointment must be approved by the Executive Committee of Graduate Studies and Research.

Examinations:

Qualifying Examination: At the discretion of the doctoral committee, a qualifying examination may be required. A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in the major subject; it is designed to test the student's preparation for advanced graduate work. If such an examination is required, it must be administered and passed before the student registers for the second year of PhD. work.

The Proposal: Normally within the first 2 years, the student will present in the form of a seminar an outline of their proposed thesis research. This will be presented to the doctoral committee who must approve, with or without modifications, or reject the proposal. Thereafter, at least once a year the student will report their progress in the form of a seminar.

Comprehensive Examination: Students who have previously obtained a Master's degree must attempt this examination very early between twelve to eighteen months of registering for the PhD. Program. Other students must take it within twenty-four months of registration for the PhD. Program. A comprehensive examination committee will conduct the comprehensive examination. The committee will consist of the chair, three members of the supervisory committee, including the supervisor, and an additional member who has a scholarly interest in the student's general area of specialization.

This set of examinations requires the students to demonstrate an adequate background in the general discipline of applied science, and an advanced knowledge in their fields of specialization and research.

The comprehensive examinations will be conducted in two parts:
a) In the first part, a scheduled supervised written portion, of three hours duration, designed to test the student's general knowledge on core subjects in the field of study as approved by the examination committee, with questions set and answers evaluated by the examination committee.
b) An oral examination to be evaluated by the examination committee. The objective of this part of examination is to evaluate the student's ability to integrate general knowledge from different areas into their research plan. The candidate will be required to submit a report, up to 25 pages in length, on the proposed research program. The report must include: (i) a critical survey of the directly related literature in the field, and (ii) an outline of the proposed research program, including its justification, the approach to be taken, specific analytical or experimental methods, perceived or anticipated problems, and a proposed timetable to accomplish the task. Five copies of the report must be in the hands of the examining committee at least seven days prior to the date of the oral examination. The oral examination will be conducted in two sessions. In the first part, the candidate will be required to present their report in

a summary fashion to the committee followed by questions directly related to the proposal and the candidate's specific area of research. The second part of the oral examination will emphasize the candidate's comprehension as well as breadth and depth of knowledge of their discipline area. The duration of the two parts of the oral examination is expected to be about one and half hours each, separated by a recess of half an hour.

It is the responsibility of the examining committee chair to call a meeting of the committee at least seven days prior to oral examination to: (i) examine the candidate's records and the type of background necessary to carry on their research successfully, and (ii) assign the preparation of the written questions for the first part, to members of the committee, other than the supervisor. The supervisor will not participate in the preparation of the written questions but is expected to participate in the oral examination.

The Examination Committee will determine the student's overall performance and success in the comprehensive examination. If the student is unsuccessful, the committee may require:
i. That the student repeats all or part of the comprehensive examination at a specified time;
ii. That the student takes and pass remedial course work before repeating all or part of the examination; or
iii. After consultation with, and approval by, the doctoral committee, that the student withdraws from the program.

Final Examination. The final appraisal of the dissertation and the conduct of the final oral examination of the dissertation will be carried out by an examining committee. The examining committee will consist of the doctoral committee, the Dean of Graduate Studies and Research (or designate) as chairperson (non-voting) and an external examiner. The final examination normally follows a public seminar by the candidate, open to the public. The passing of the final oral examination of the dissertation requires both an adequate dissertation and a satisfactory defence of the dissertation. The examining committee will conduct this examination, in accordance with the Faculty of Graduate Studies procedures.

This set of examinations requires the students to demonstrate an adequate background in the general discipline of Industrial and Manufacturing Systems, and an advanced knowledge in their fields.

Master of Applied Science (MASc)

MASc program requirements are common for the following Engineering programs: Civil Engineering, Electrical Engineering, Engineering Materials, Environmental Engineering, and Mechanical Engineering. Industrial Engineering has slight variation. The areas of specialization are listed by Department.

Admission Requirements
A candidate for the degree of Master of Applied Science shall hold the degree of Bachelor of Applied Science from this University or an equivalent degree in Engineering or Applied Science. In addition, the applicant must have at least second-class standing or its equivalent in the final year and be recommended by the Program Graduate Committee in which the candidate plans to undertake studies.

Applicants with degrees in related fields will be considered but will normally require strengthening of their background in Engineering. At the discretion of the Program, the Graduate Record Examination (GRE) may be required.

All applicants whose native language is not English are required to satisfy the English proficiency requirement.

Possession of the minimum requirements does not automatically ensure acceptance.

Degree Requirements

The specific minimum program requirements for the MASc include the successful completion of:

1. Course Requirements: Satisfactory completion of courses comprising between twelve and twenty-four term hours, depending on the term hour equivalence assigned to the mandatory thesis or major paper. A thesis may be equivalent to as many as eighteen term hours, and a major paper to as many as six term hours of the total minimum requirement of thirty term hours.

2. Either a thesis or a major paper as specified below:

(a) Thesis: A thesis incorporating the results of an original investigation is required of all candidates except those students who are doing non-thesis research toward a major paper. Before writing the thesis the student must meet with the Master's committee to obtain permission to write the thesis. The Master's committee will grant this permission when the student has shown sufficient competence and has accomplished substantial research. After completion of the thesis, each candidate will be required to make a satisfactory oral presentation and defence of the thesis as described below.

(b) Major Paper: For those candidates doing non-thesis research, a major paper is required. The topic of the major paper is normally research based on the existing literature in the field of study. The candidate will be required to make an acceptable oral presentation to the Master's committee based on the major paper (see below).

3. Mechanical Engineering students in the MASc program must take MECH-8295 (MASc Graduate Seminar) and Mechanical Engineering students in the PhD program must take MECH 9295 (PhD Graduate Seminar).

Note: Part-time students who are not able to take the MASc Graduate Seminar course have to take an additional 3-credit graduate course approved by his/her degree supervisor(s), if necessary, to fulfill the overall credit requirement for the degree; or Part-time students who are not able to take the PhD Graduate Seminar course have to take an additional 3-credit graduate course approved by his/her degree supervisor(s), if necessary, to fulfill the overall credit requirement for the degree."

4. Industrial Engineering students must additionally take INDE-8595 (Graduate Seminar). They are expected to register in it every semester offered. Normally in the final year of their degree, they are to give a seminar presentation and will receive a Pass/Fail grade. For the MASc. thesis or Major Paper in Industrial Engineering the final grade is “Satisfactory” or “Unsatisfactory”.

5.Civil Engineering and Environmental Engineering: Students may take up to two graduate courses outside the
program for credit provided these courses are deemed relevant and approved by the student's supervisor and
the Program Graduate Coordinator. Under special circumstances, one of these two courses may be at the senior undergraduate level. In addition, the students must complete 36 hours of participation in the MASc Seminar, including delivering one presentation in the seminar, by registering in CIVL 8595 or ENVE 8595, respectively.

6. Students who are unable to complete the Graduate Seminar course may take an additional 3-credit graduate

course approved by the Program Graduate Coordinator (or Department Head) to fulfill the credit requirement
for the degree. Other exceptions to the nominal graduate seminar requirements may be approved by the Graduate Coordinator (or Department Head) to allow the graduate student to fulfill the graduate seminar requirement through alternate means if the current provisions are not feasible. This request must be supported by the student's supervisor.

Residence and Time Limits
The minimum period of study for a Master's candidate is twelve months. The maximum duration of full-time study as a Master's candidate is three years. Part-time Master's candidates will undertake the equivalent of a minimum of one year of full-time study. For a part-time Master's candidate the maximum time limit generally will not exceed five calendar years. Master's candidates who expect to require an extension of these time limits must petition the Dean of Graduate Studies, giving reasons for the request and plans for completion of the work. The Chair of the Program Graduate Committee will then make a recommendation to the Dean of Graduate Studies.

Committees
Research undertaken as part of a Master's program is normally directed and supervised by a Master's committee. Whereas the student's advisor provides day-to-day guidance and direction, the committee is ultimately responsible for the overall supervision to ensure that adequate progress is maintained. The Master's committee will consist of at least three members with the student's advisor as chairperson. The advisor must be a member of graduate faculty.

At least one member shall be from a Program within the University of Windsor other than the one in which the student is majoring. The student's advisor will propose the names of the Master's committee and these will be subject to the approval of the Program Graduate Committee and the Executive Committee of the Faculty of Graduate Studies. Within one month after registration, each student will be assigned to a Master's committee.

The final appraisal of the thesis and the conduct of the final oral examination of the dissertation will be carried out by the examining committee. The examining committee will consist of the Master's committee and the Chair of the Program Graduate Committee or designate of the Dean of Graduate Studies as chairperson (non-voting).

Examinations: At the discretion of the Program Graduate Committee a qualifying examination may be required. A qualifying examination is one in which the student is asked to demonstrate a reasonable mastery of the fundamentals in the major subject; it is designed to test the student's preparation for advanced graduate work. If such an examination is required, it must be administered and passed before the student registers for the final candidate year of Master's work.

In addition to the usual examination on course work, all students must meet the following requirements:

1) **Review of Progress on Research or Major Paper**: Within the first year a full-time student will present in the form of a seminar an outline of his or her proposed thesis research or outline the content of his or her major paper. This will be presented to the Master's committee, who must approve, with or without modifications, or reject the proposal. Thereafter, at least once a year, the student will report his or her progress in the form of a seminar.

2) **Final Examinations:** The passing of the final oral examination on the thesis (or the major paper) requires both an adequate thesis (or major paper) and a satisfactory defence. The examination will be conducted by the examining committee and the thesis defence will be chaired by the Chair of the

Program Graduate Committee or appointed designate. If the examining committee cannot arrive at a unanimous decision to award a passing grade, a majority decision will be accepted provided there is no more than one dissenting vote. If there is more than one dissenting vote, the student may be required to carry out additional work if the thesis is judged to be adequate in all other respects, or the student may be required to withdraw.

Grading: The grading system is outlined in "Faculty Regulations".

The Faculty of Engineering requires that students maintain at least a 70% average at all times.

Courses in which a grade of 70% or higher is received will be accepted for graduate credit. In addition, upon the positive recommendation of the Chair of the Program Graduate Committee and advisor concerned, credit may be granted by the Faculty of Graduate Studies for not more than two term courses in which a grade between 65-69% has been obtained.

If a student fails to obtain credit in a course, the course may be repeated only once, at the discretion of the Chair of the Program Graduate Committee concerned and the Dean of Graduate Studies. No student may repeat, or replace with another course, more than two term courses in which credit was not obtained.

All research work for which a letter grade is assigned must be graded 70% or better to receive credit.

Make-up courses will not count for graduate credit. Make-up courses are those courses required to compensate for deficiencies in the student's academic background.

In exceptional cases, at the discretion of the Chair of the Program Graduate Committee and the advisor, a graduate student may take one undergraduate course for credit.

Integrated BASc/MASc

The Faculty of Engineering offers a Bachelor's/Master's Integrated Engineering Degree program which allows students with outstanding academic ability to achieve both a BASc and MASc degree in a time period as short as five years. This program treats the educational process through the BASc to the MASc degree as a single coherent integrated whole, while ensuring that the requirements for both degrees are fully satisfied. This structured program represents a complementary alternative to the existing separate undergraduate and graduate degree programs.

Application to the integrated BASc/MASc can be made early in the Winter semester of the student's third year of undergraduate B.A.Sc. study. Normally, only applicants who have a cumulative average of at least 77%, and a semester average of 77% in the Fall semester of their third year of undergraduate BASc. study may be granted admission to the integrated program which confers conditional admission status to the MASc. program.

Contact the appropriate Engineering Department for more information.

Research in Outside Institutions
Research for the PhD or MASc degree, in part or in whole, may be carried out in an outside institution (e.g., industrial, governmental, or academic university). A student who does research at an outside institution must fulfil the same requirements as a student doing on-campus research. The only exception is that the time spent doing the off-campus research relevant to the thesis or dissertation will be credited

toward the residence requirement. In addition to the general requirements, a student applying for permission to do research at an outside institution must provide:

1) A detailed statement of the research proposal, including arrangements for supervision, and of the circumstances under which the research is to be carried out;
2) Evidence that the institution has adequate facilities for the research; and that the applicant will be able to pursue independent research;
3) A proposed time schedule;
4) A letter of support from a responsible person in the outside institution giving approval of the proposal and accepting these regulations.

Master of Engineering Management (MEM) (Joint Program with Business)

The Master of Engineering Management program is offered jointly between the Odette School of Business and the Faculty of Engineering.

Master of Engineering (MEng)

(As of Fall 2024, there are no new admissions to the Master of Engineering (Materials Option)

Program requirements are common for: Automotive Engineering, Civil Engineering, Electrical and Computer Engineering, Engineering Materials, Environmental Engineering, Industrial Engineering, Mechanical Engineering.

The Master of Engineering (MEng) degree offered at the University of Windsor is a course work professional program open to students who satisfy the admission requirements. The MEng Program takes three to five semesters to complete but is structured in such a way that it may be completed in one year by a full-time student. The minimum period of full-time registration for the MEng degree is three semesters and the maximum allowable time is five semesters. For part-time students, the minimum period of registration for the MEng degree is eight semesters and the maximum allowable time is fifteen consecutive semesters. Practical work-experience placements are available for full-time students only but cannot be guaranteed.

MEng Electrical and Computer Engineering, Mechanical Engineering, Engineering Materials and Industrial Engineering

Students in MEng Electrical and Computer Engineering, Mechanical Engineering, Engineering Materials, and Industrial Engineering must take Eight (8) courses, equivalent to 24 credits, including:

(a) four (4) mandatory courses, equivalent to 12 credits, including GENG-8000 (Engineering Technical Communications),* GENG-8010 (Engineering Mathematics) and GENG-8020 (Engineering Project Management) and GENG-8030 (Computational Methods and Modeling for Engineering Applications) equivalent to 12 credits.
(b) four (4) graduate courses, equivalent to 12 credits, one of which may be taken from the 4000-level courses related to the area of study. Students in the MEng Electrical and Computer Engineering are not permitted to take a 4000-level course.

Full time MEng students in Electrical and Computer Engineering, Mechanical Engineering, Engineering Materials, and Industrial Engineering can only register in a major course under one of the following conditions:
1- Successfully completed four mandatory courses (GENG-8000, GENG-8010, GENG-8020 GENG-8030),
2-Successfully completed three mandatory courses (GENG-8000, GENG-8010 GENG-8020) and simultaneously registered in the fourth mandatory course (GENG-8030) and a major course.

Full-time Co-op MEng Students in Electrical Engineering and Computer Engineering, Mechanical Engineering, Engineering Materials, and Industrial Engineering can enroll in a maximum of two courses in their first semester and three courses in their second semester.

Full-time non-Coop MEng students in Electrical Engineering and Computer Engineering, Mechanical Engineering, Engineering Materials, and Industrial Engineering should take maximum of two mandatory courses in their first two semesters, while in the second semester they can add an extra graduate course from their host program.

Part time MEng students should complete all four mandatory courses (GENG-8000, GENG-8010, GENG-8020, GENG-8030 before registering in a major course.

MEng Civil Engineering and MEng Environmental Engineering

Students in MEng Civil Engineering and MEng Environmental Engineering must take eight (8) courses, equivalent to 24 credits, including:
(a) three (3) mandatory courses, equivalent to 9 credits:
GENG-8000. Engineering Technical Communications*,
GENG-8010. Engineering Mathematics
GENG-8020. Engineering Project Management
(b) five (5) major courses, equivalent to 15 credits, one of which may be taken from the 400-level courses related to the major.

Full-time MEng students in Civil Engineering and Environmental Engineering can only register in a major course under one of the following conditions: they have successfully completed three mandatory courses (GENG-8000, GENG-8010, and GENG-8020); or they have successfully completed two mandatory courses (selected from GENG-8000, GENG-8010, and GENG-8020) and are registered in a third mandatory course.

Full-time MEng Students in Civil Engineering and Environmental Engineering can take a maximum of two courses in their first semester.

Part-time MEng students in Civil Engineering and Environmental Engineering should complete all three mandatory courses (GENG-8000, GENG-8010, GENG-8020) before registering in a major course.

Master of Engineering (MEng) Automotive Engineering

Students in Master of Engineering (MEng) Automotive Engineering must take eight (8) courses, including:
(a) 7 Core Courses:
AUTO-8010. Mobility and Society
AUTO-8020. Vehicle Systems
AUTO-8030. Engineering Project Management, Automotive Lean and Quality Processes
AUTO-8040. Vehicle Propulsion
AUTO-8050. Vehicle Energy and Thermal Management
AUTO-8060. Powertrain Systems
AUTO-8070. Manufacturing and Robotic Fundamentals

(b) 1 Non-Core course chosen from:
AUTO-8015. Automotive Body Structures and Components
AUTO-8025. Sensors and Controls for EVs

2. Program Regulations

2.1 A candidate, with the permission of the host Department, may register for at most one senior undergraduate course (4000-level) in the MEng Program. All courses must be for credit only.

2.2 An MEng candidate must maintain a cumulative average of 70% or above to be in good standing and be eligible to graduate.

2.2.1 A grade of less than 60% in any course counts as a failure and that course must be repeated (if it is a required course) or in the case of an elective course, a replacement of equivalent weight must be taken and passed.

2.2.2 Candidates with a cumulative average of less than 70% will be placed on probation and are required to raise their cumulative average to 70% or above within one term.

2.2.3 MEng candidates who are on probation and who do not raise their cumulative average to 70% or above in the subsequent term may be required to withdraw (RTW).

2.2.4 MEng candidates may receive credit for a maximum of two courses with grades between 60% and 69% over their entire program. Candidates must repeat or replace (as detailed in 2.2.1 above) a third course in which they receive a grade below 70%.

2.2.5 MEng candidates who receive more than three course grades below 70% in their program may be required to withdraw (RTW).

2.3 Co-op/Internship – Work Term Option

MECH-8071. The work term is offered on a pass/fail basis. It provides the opportunity for students to enhance academic learning with valuable industrial experience, and to develop transferable skills in an applied setting. Students must apply for admission to the Co-op/internship option in their first study term (Prerequisite: Departmental permission). Students can complete a four (4) month work term.

All Co-op/Internship positions must be full-time, paid, related to the degree program, and approved by the University. The process of securing a Co-op/Internship position is competitive. Co-op/Internship students will apply for work opportunities as advertised by the Centre for Career Education using an Internet-based software program and employers will make interview and hiring decisions. Students are also encouraged to seek Co-op/Internship employment outside of the advertised postings by completing a guided job search process facilitated by the Centre for Career Education. All Co-op/Internship students must, in the first and second semester of their program, register and pass three (3) graduate courses for their program.

Withdrawal from the Co-op/Internship program will be granted only under exceptional circumstances. For example, it must be determined that the student has no outstanding commitments to employers. Students who wish to withdraw must meet with a Co-op Coordinator and complete a withdrawal form. However, the only time a student may withdraw from a graduate Co-op/Internship program without further Co-op/Internship fee payment implications is by the 1st Friday of classes after their first Co-op/Internship work term. Students who withdraw from Co-operative Education at any other time will be liable for paying the Co-op/Internship fee for the term in which they are dropping and one additional term.

In the interest of building solid partnerships with employers, students who have accepted a co-op employment offer (either by ranking a position in round 1 of the job competition or by accepting a position in later rounds (either verbally or in writing) must honour that commitment. Therefore, once students have accepted an offer of employment for a work term, they will be considered registered in the appropriate work term course and must remain in the Co-op/Internship program until they have completed their work term requirements. Failure to honour these commitments and/or to complete all work term requirements will lead to being required to withdraw from the Co-op/Internship program and will result in a failing grade on his/her transcript for that work term.

Master of Engineering co-op/internship students will be registered in a work term course for the four-month term of their placement. This course will be evaluated on a pass-fail basis. In order to receive a passing grade, students must:

Submit learning objectives at the beginning of the -month work term

Receive a satisfactory mid work term assessment from supervisor
Submit and receive a passing grade on a work term report (guidelines prepared by faculty and report evaluated by faculty)

Complete and receive a satisfactory post-work term presentation (evaluated by Co-op Coordinator and Faculty)
Receive a satisfactory final work term performance evaluation by employer

3. Schemes of Study
The Master of Engineering may be taken by full-time students or those who wish to study on a part-time basis while remaining in full-time employment. All applicants for the MEng program are expected to be entirely self-funded and no financial assistance will be provided by the Faculty of Engineering or the University of Windsor. International students are admitted as full-time students only.

3.1 Full-Time Students will be:
3.1.1 required to register for a maximum of three courses per semester,
3.1.2 required to register for a minimum of two courses per semester,
3.1.3 expected to complete all degree requirements within 5 academic semesters.

3.2 Part-Time Students will be:
3.2.1 required to register for a maximum of one course per semester,
3.2.2 required to complete all degree requirements within 15 academic semesters and should not have more than two semesters of continuous "inactive" status

4. Admission Requirements
MEng applicants shall be recommended for admission by the Faculty of Engineering's Associate Dean for Professional Programs. Official admission to any program of graduate studies is in the form of a "Letter of Acceptance" issued by the Faculty of Graduate Studies. Please note that the following are minimum requirements and do not guarantee admission.

4.1 Undergraduate degree (BASc /BSc. in Engineering/B.Eng. degree or equivalent*) with at least a 72% average over the last four years. International applicants are advised to refer to the specified minimum admission requirements, listed by country, at the Faculty of Engineering's Professional and Graduate Studies (FEPGS) website and the Faculty of Graduate Studies website. Students whose undergraduate degree programs do not provide them with sufficient GPA/overall average, background in Design and Applied Science and Professional/Technical communications are required to complete and Engineering Honours Certificate at the undergraduate level before admission to candidature for the MEng degree. Students entering and successfully completing the Honours Certificate in any Civil, Environmental, Industrial Manufacturing System Engineering as well as Electrical and Computer Engineering with the minimum overall average of 77% can gain admission to the MEng in the respective program.

4.2. The language of instruction for the MEng courses is English. Applicants will be required to provide certification of English language proficiency, if they have:

4.2.1 not completed three or more years of post-secondary work at a Canadian institution or in a country where the official language is English.

4.3 Where applicable, a student's certification of English language proficiency can be demonstrated by a minimum score set by the department. For minimum requirements in other equivalent exams, information is available on the Faculty of Graduate Studies website. The Faculty of Engineering and the

Faculty of Graduate Studies reserve the right to require further demonstration of English Language proficiency.

4.4 The Department may consider for admission to its degree programs students from outside Canada who have excellent academic preparation, but who do not meet the usual standards of English language proficiency. Successful completion of the English Language Improvement Program (ELIP) Level 3 with the minimum score of 75% will be considered as a means to gain admission to the Department for such students.

4.5 Students seeking admission to the Department's MEng programs must also complete the Department's Graduate Student Information Form and the Faculty of Graduate Studies Admission Reference form.

5. Degree Program Transfers (MEng, MASc and PhD)

5.1 The MEng is a course-based professional degree and does not require a research thesis. As admission to the Department's PhD program requires a demonstrated record of research capabilities, MEng graduates are not eligible for direct admission to the PhD program, see 5.2.

5.2 A full-time MEng student may apply for admission into the MASc research degree track after successfully completing 4 MEng courses with an overall average of at least 77%. A maximum of two courses from their major (excluding GENG-8XXX courses) may be granted advanced standing towards the requirements of the MASc degree. Applications for admission to the MASc from the MEng program must conform to the general regulations for admission to the MASc program. Admission to the MASc program also requires that a faculty member in the department is able and willing to act as a research advisor. Admission is not guaranteed. MEng students, once admitted to the MASc Program cannot transfer back to the MEng Program. They will be required to re-apply to the MEng Program. If admitted to the MEng Program a student may receive advanced standing for a maximum of 4 (four) graduate level courses.

5.3 While strongly discouraged, a full-time MASc student may apply for admission into the MEng degree track. A maximum of four courses of advanced standing may be granted towards the requirements of the MEng degree provided the courses are on the Department's approved MEng course list. Applications for admission to the MEng from the MASc program must conform to the general regulations regarding admission to the MEng program. Admission is not guaranteed. Students transferring from the MASc research degree to the MEng course based degree will be expected to be self-supporting and can expect no financial assistance from the Department or University during the remainder of their studies.

5.4 MASc students transferring to the MEng must relinquish their research student office and will be required to return any computer equipment provided for their use as an MASc research student.

^Contact the department for the specific courses in Computer Engineering.

COURSE TRANSFERS:
Students who have either failed to complete, or cannot continue in, the Degree of Master of Engineering (M.Eng.), and have been accepted into the Honours Certificate may be allowed to retain as credit a maximum of four (4) graduate courses in which they have received a grade of 70% or higher. The transfer of the courses is at the discretion of the Department Head and Associate Dean Academic, Faculty of Engineering. Students who transfer to the HCP from the MEng, and have successfully completed the HCP with 77%, may reapply for admission into an Engineering Graduate program but will not be given credit for any courses they previously transferred to the HCP.

MECHANICAL, AUTOMOTIVE, MATERIALS ENGINEERING AREAS OF SPECIALIZATION

ENGINEERING MATERIALS

PhD, MASc and MEng graduate programs in Engineering Materials are administered by Mechanical, Automotive and Materials Engineering upon the advice of its Graduate Studies Committee for Engineering Materials. Research is concentrated on the physical, mechanical, tribological, chemical and processing aspects of materials. The program hosts one NSERC/ Industrial Research Chair: i) Chair in Tribology of Light-weight Materials. Particular research topics include:

Material Design, Development: Aluminum alloys (wrought, cast, particulate, reinforced), structure refinement, nanocrystalline alloys, solidification and precipitation processing, metal hydrides for energy applications, ceramics and cementitious materials, metallic forms, materials for batteries and fuel cells, smart materials, computational materials science.

Material Processing: Surface coatings, surface modification technologies (PVD, CVD, thermal spraying) welding, machining, galvanizing and galvannealing of steels, steel fabrication, nanofabrication.

Mechanical Properties of Materials: Creep and fatigue behaviour, deformation mechanisms, computer simulation of deformation, corrosion, erosion, impact testing, crashworthiness evaluation.

Light Metals Casting Technology: Advanced foundry processes for lightweight castings for automotive engines; aluminum and magnesium alloys; new generation foundry materials, solidification modelling, die casting process control.

Tribology (Wear) Research: Friction and wear of metal matrix composites, coatings for tribological applications, development of wear resistant materials for automotive applications, micromechanical modeling of tribological processes.

INDUSTRIAL ENGINEERING

PhD, MASc. and MEng. graduate programs in Industrial Engineering are administered by Mechanical, Automotive and Materials Engineering.

MECHANICAL ENGINEERING

PhD, MASc and MEng graduate programs in Mechanical Engineering are administered by Mechanical, Automotive and Materials Engineering upon the advice of its Graduate Studies Committee for Mechanical Engineering. PhD, MASc and MEng programs are offered in the fields of Automotive, Machine Dynamics and Design, Thermo-Fluids. Prospective students should note that the M.Eng. in Mechanical Engineering (Automotive Field) (with or without co-op/internship) is specifically designed for a cohort of international students, particularly foreign-trained engineers.

International MASc In Automotive Engineering/Laurea Magistrale in Automotive Engineering

This is a Dual degree program with Politecnico di Torino, Italy

Admission Requirements

Admission will be granted, within the limits of program availability (initially 5 students/year) to University of Windsor students possessing a Bachelor of Applied Science degree in Mechanical Engineering (or equivalent engineering degree) from an accredited Canadian university. Standard admission requirements for entry in the Mechanical Engineering MASc program will be met. Applications will be reviewed by the coordinator for the International Master of Applied Science in Automotive Engineering program. Student application files will be forwarded to the Faculty of Graduate Studies, with a request for formal admission of those students approved by the program coordinator. Accepted students will be enrolled at the University of Windsor with M2 status (Master candidate) in the International Masters in Automotive Engineering.

For Politecnico di Torino students, admission will be granted, within the limits of program availability (initially 5 students/year) to Torino students possessing a Laurea [Bachelor's degree] in Automotive Engineering or Mechanical Engineering (or equivalent engineering degree) from an accredited European university. Student files will be reviewed by the program coordinator similar to the University of Windsor process. Accepted students will begin the first year in the Laurea Magistrale in Automotive Engineering at Politecnico di Torino.

Total courses: Three (3) Windsor courses and 60 ECTS credits at Torino (which equates to 3 courses at the Politecnico di Torino for the Torino students, and 30 ECTS of courses plus a 30-ECTS thesis for the Windsor students). The suggested course choices at each school will be streamed into four key areas: Manufacturing Management, Automotive Vehicle Design and Engineering, Automotive Powertrain and Virtual Engineering for Product Development.

Each student will be required to take at least one course in each of the above four areas plus two others of their choosing. In this way, all of the graduates of the proposed program will receive a well-rounded education in Automotive Engineering and an opportunity to build a significant level of specialized expertise in an area which is of particular interest to them.

Degree Requirements

(a) Three (3) Windsor graduate courses and an equivalent number of ECTS credits in courses in Italy. The total course requirements will be equivalent to the weight of study done to complete a Windsor Masters' degree in Engineering with a thesis (thus making the students eligible to continue their studies at the doctoral level).

The Torino students will complete 60 ECTS course credits and 3 Windsor graduate courses which makes them eligible for doctoral work in Europe when completed in conjunction with their major thesis project.

(b) Thesis Project
Each student will complete a thesis project. Thesis co-supervision will be by both Windsor and a Torino faculty member. For the purposes of the University of Windsor degree, the thesis committee will consist of the co-supervisors, an internal program reader, and an external program reader. Additional Committee members may be added to meet the requirements of the Torino program. The thesis project will be a substantial piece of work representing an advance on the state of the art of a character of that expected for a Masters degree in Engineering. Each student in the program will complete a Master of Applied Science thesis as is customary in the University of Windsor MASc program.

(c) The Windsor students will each complete either one or two 4-6 month internships under the Industrial Research and Development Internship (IRDI) program internship at the ARDC facility during the spring of their first year. Following that they will travel to Italy where they will do their thesis research at the facilities of Fiat Centro Research in Torino.

Program Layout

University of Windsor Students
Year 1 (University of Windsor)
Term 1: 1-2 courses
Term 2: 1-2 courses
Term 3: 1-2 courses
3 courses and planning of thesis.
60 European Credit Transfer (ECTS)

Year 2 (Politecnico di Toronino)
Semester 1: 30 ECTS courses 30 ECTS thesis
Semester 2: 30 ECTS courses 30 ECTS thesis
Industry-Academic Research Thesis
60 European Credit Transfer (ECTS)

Total Credits:
Total courses/credits = 3 courses in Windsor + 30 ECTS of courses and 30 ECTS for Thesis in Torino

Politecnico di Toronino Students
Year 1
Semester 1: 60 ECTS courses
Semester 2: 60 ECTS courses
3 courses + Major Industry-Academic Project Report (equivalent to Thesis)
60 European Credit Transfer (ECTS)

Year 2
Term 1: 1-2 courses
Term 2: 1-2 courses
Term 3: Project
3 courses + Major Industry-Academic Project Report (equivalent to Thesis)
Total courses/credits = 60 ECTS of courses in Torino + 3 courses in Windsor
60 European Credit Transfer (ECTS)

TOTAL European Credit Transfer (ECTS) : 120

NOTE: The term “ECTS Course” refers to the European Credit Transfer and Accumulation System. It is an EU designation for a number of credit-hours that will be equivalent to a comparable number of University of Windsor graduate course credits (please see the note below on the ECTS). The total number of ECTS and Windsor credits undertaken by each student will be at least equal to that required to earn a traditional University of Windsor Master’s of Applied Science degree.

NOTE: The Italian (Torino) MASc students will not be eligible for GA support while they are present in Windsor.

International Master of Applied Science (MASc) In Civil Engineering

Graduates of the dual degree program will receive two degrees:

Laurea Magistrale in Civil Engineering (issued by the University of Udine in Italy)
International Master of Applied Science in Civil Engineering (issued by the University of Windsor).

Areas of Study: The suggested course choices at each university will be streamed into five key areas: Structural Engineering, Water Resources, and Transportation Engineering, Geotechnical Engineering, and Building and Construction Management. Each student will be required to take courses in at least two key areas. In this way, all the graduates of the proposed program will receive a well-rounded education in civil engineering and an opportunity to build a significant level of specialized expertise in an area that is of particular interest to them.

Admission Requirements
Admission will be granted, within the limits of program availability (initially 3 students/year) to University of Windsor students possessing a Bachelor of Applied Science degree in Civil Engineering (or equivalent engineering degree) from an accredited Canadian university. Standard admission requirements for entry in the Civil Engineering MASc program will be met. This includes acceptance by a thesis advisor, who must have a plan for the research and coursework approved by the Department Head and the Graduate Coordinator at Windsor, as well as the Udine Head of the Department. The regular admissions process in each of the partner schools will be supplemented by an interview by a panel made up of representatives from the home institution of the student. As is normal practice, applications will be reviewed by the Graduate Coordinator of the Civil Engineering program. Student application files will be forwarded to the Faculty of Graduate Studies, with a request for formal admission of those students approved by the Graduate Coordinator. Accepted students will be enrolled at the University of Windsor with M2 status (Master candidate) in the International Masters in Civil Engineering. For University of Udine students, admission will be granted, within the limits of program availability (initially 3 students/year) to students possessing a Laurea [Bachelor's degree] in Civil Engineering (or equivalent engineering degree) from an accredited European university. Student files will be reviewed by the Course of Studies Coordinator; similar to the University of Windsor process. Accepted students will begin the first year in the Laurea Magistrale in Civil Engineering at the University of Udine.

Degree Requirements
(a) For Windsor students: 3 Windsor graduate courses and 30 ECTS credits in courses in Italy. The total course requirements are equivalent to the weight of study done to complete a Windsor Master of Applied Science degree in Engineering with a thesis (thus making the students eligible to continue their studies at the doctoral level). For Udine students: 60 ECTS course credits and 3 Windsor graduate courses which makes them eligible for doctoral work in Europe when completed, in conjunction with their major thesis.

(b) Students from both institutions will be required to enroll in the graduate seminar course (CIVL-8595) for two terms while at the University of Windsor.

(c) University of Windsor students must complete at least two of their courses in Term 1 of Year 1, and three no later than Term 2 of Year 1.

(c) Thesis:
Each student will complete a thesis with supervision and advisement by both Windsor faculty and Udine department members. The Windsor students will carry out 58% of their thesis work in Windsor and the remainder in Udine and the Udine students will work on their thesis primarily in Windsor.

For the purposes of the University of Windsor degree, the thesis committee will consist of the principal and co-advisor, an internal program reader, and an external program reader, as per Windsor's standard requirements for thesis committees. Additional Committee members may be added to meet the requirements of the Udine program. The principal advisor for the Windsor students will be a Windsor

faculty member, with a department member from Udine acting as an advisor. Similarly, for Udine students the principal advisor will be a department member from Udine, with an advisor assigned from Windsor faculty. The thesis committee will be formed in the beginning of the first year when students plan their approach to the thesis. The coordination of supervision will be conducted through progress report meetings via tele- or videoconference. Under supervision of the advisors, the thesis will be written and submitted to the committees at both universities in a format that is acceptable to both institutions. An oral defence of the thesis will be accomplished by an in-person examination at the University of Windsor with a video teleconference link to the University of Udine. The student must also give a presentation on the thesis at the University of Udine.

The thesis should be significant in its embodiment of an advance in the state of the art of the field. It must be delivered at a level commensurate with the Engineering Master of Applied Science Degree.

ENGINEERING COURSES

CIVIL ENGINEERING (CIVL-)

Courses offered by Civil Engineering at the graduate level are listed below. Students may take courses other than Civil Engineering with permission of the Head of the Department and the advisor.

All courses listed will not necessarily be offered in any given year.

CIVL-8006. Life Cycle Thinking
Practical and theoretical applications of life cycle thinking in engineering projects, products, and processes. Understand international standards and methods in Life Cycle Assessment (LCA), Life Cycle Costing (LCC), and Social Life Cycle Assessment (S-LCA). Analyze, interpret, provide critical feedback, and report on claims on sustainability. (Antirequisite: CIVL-8900-49.) (Cross-listed with ENVE-8006 and MECH-8006.) (May be offered as a cross-career course with MECH-4241 (Section 1) and CIVL-4970.)

CIVL-8020. Building Information Modeling
Practical and theoretical applications of building information modeling (BIM) in civil and environmental engineering projects. Understand BIM standards (e.g., ISO), use BIM software for buildings, and conduct BIM-based analysis (e.g., solar analysis, structural analysis, and energy analysis). Enhance the efficiency of project management with the aid of BIM. (Antirequisite: CIVL-8900-50.)

CIVL-8200. Theory of Elasticity and Plasticity
Analysis of stress and strain; elastic and plastic stress-strain relations; general equations of elasticity; yield criteria; applications to elastoplastic problems, including rotating disks, thick-walled tubes, reinforced disks, torsion of various shaped bars; stress concentration. (3 lecture hours a week.)

CIVL-8210. Finite Element Methods for Solids and Structures
Structural idealization; stress analysis of 2-D and 3-D solids; error estimation and mesh adaptivity; elastic formulations and uses of beam, plate and shell elements; nonlinear formulations; structural stability; introduction to finite element methods in structural design optimization. (3 lecture hours a week.)

CIVL-8220. Analysis of Plate and Shell Structures
General theory of thin plates and shells. Analytical solutions of circular and rectangular plates. Membrane stresses in shells. Bending stresses in shells. Finite element methods for plates and shells. Buckling of cylindrical pressure vessels. (Prerequisite: CIVL-8200 or equivalent.) (3 lecture hours a week.)

CIVL-8250. Theory of Stability
This course is designed to give an insight into the basic phenomenon of structural stability. Elastic and plastic flexural-buckling of columns with axial and eccentric loads is studied. Energy and numerical methods are used. Stability functions are introduced and used to study trusses and rectangular frames, with and without sidesway. Some discussion of torsional and torsional-flexural buckling, lateral buckling of beams. (3 lecture hours a week.)

CIVL-8310. Prestressed Concrete
Materials, principles of prestressing systems; prestressing losses; analytical treatment of the effect of shrinkage, creep of concrete, and cable friction on stresses; analysis and design of statically determinate and indeterminate structures; design codes; research background; introduction to prefabricated concrete structures. (3 lecture hours a week.)

CIVL-8330. Structural Dynamics
Formulation of equations of motion; single degree-of-freedom systems: free vibration response and response to harmonic, periodic, impulse, and general dynamic loading; analysis of non-linear structural response; multi degree-of-freedom systems: equations of motion, structural property matrices, undamped free vibration, Raleigh's method, forced vibration response, practical vibration analysis; continuous systems: partial differential equations of motion, analysis of undamped free vibration, analysis of dynamic response, wave propagation analysis. (3 lecture hours a week.)

CIVL-8340. FRP Reinforced Concrete Structure
Advanced composite materials - constituents and products; structural applications, reinforced concrete members, prestressed concrete members, applications with chopped fibres, repair and rehabilitation; innovative applications. (3 lecture hours a week.)

CIVL 8350. Wood Design
Introduction to structural wood design based on CSA O86 Engineering Design in Wood. Topics include: wood as an engineering material; sawn lumber; structural panels; connections; lateral-load resisting systems; glulam; and cross laminated timber

CIVL-8360. Earthquake Engineering
Fundamental principles of earthquake engineering: seismology and strong ground motions, seismic hazard analysis, structural dynamics, methods of analysis and design, building code provisions for seismic design, and base isolation.

CIVL-8390. Advances in Soil Mechanics and Geotechnical Applications
Consolidation and improvement methods; compressibility of soils and application of new modification techniques; frost action in soils; design of gravity, cantilever and mechanically stabilized retaining walls; recent advances in the bearing capacity of foundations on reinforced soils; pile foundations and pile groups; machine foundations on piles. (3 lecture hours a week.)

CIVL-8410. Hydrology
Analysis and synthesis of the hydrograph. Streamflow routing. The hydrograph as a function of drainage characteristics; estimation of runoff from meteorological data. Snowmelt. Flow in rivers with an ice cover. Infiltration theory. Sea water intrusion in coastal aquifers. Application of hydrologic techniques including statistical methods. (3 lecture hours a week.)

CIVL-8420. River Mechanics
Theory and analysis of uniform, gradually varied, rapidly varied and steady and unsteady flow in open channels; fluvial processes; design of channels; design of hydraulic control structures. (3 lecture hours a week.)

CIVL-8430. Ground Water Contamination
Introduction of Darcy's equation and governing equation; construction of flownets, flow quantification, and ground water resource evaluation; contaminant hydrogeology, mass transport equations, reaction, and adsorption; introduction to biodegradation and natural attenuation; simulation of ground water flow and transport. (3 lecture hours a week.)

CIVL-8440. Advanced Hydromechanics
Properties of scalar and vector fields; gradiant, divergence and curl. Flow visualization. Flow kinematics: continuity equation, potential flow, stream function. Flow dynamics: transport theorems, integral and differential equations of motion. Boundary-layer theory. Turbulent flow and turbulence models. (3 lecture hours a week.)

CIVL-8441. Climate Change and Infrastructure
Climate change adaptation and mitigation measures. Engineering risk management. Resilience, systems thinking applied to engineered systems. **(Cross-listed with ENVE-8440.) (May be offered as a cross-career course with ENVE-4811.)**

CIVL-8450. Water and Wastewater Treatment
Water and wastewater quality, guidelines and standards, flow fluctuation and design capacity. Design of different unit operations and processes in water and wastewater treatment. (Cross-listed with ENVE-8450.) (May be offered as a cross-career course with ENVE-3630.)

CIVL-8460. Sediment Transport
Regime approach; turbulence theories; suspended sediment; tractive force method; bedforms and bedload transport; the Einstein method; modified Einstein method; reservoir siltation; recent developments; design of mobile bed channels; design of sedimentation basins; channel degradation. (3 lecture hours a week.)

CIVL-8595. MASc Graduate Seminar
MASc Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization, management and leadership. All full-time and part-time MASc students are required to complete 36 hours of graduate seminar classes and give one seminar presentation in the MASc Graduate Seminar course during their MASc program in Civil Engineering. Students who are not able to complete the MASc Graduate Seminar course have to take an additional 3-credit graduate course approved by their graduate coordinator to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week) (Also offered as ENVE-8595, CIVL-9595, and ENVE-9595).

CIVL-8620. Contaminants Fate and Transport in the Environment
Key environmental media and properties, persistent organic pollutants – chemical classes and properties, real and evaluative environments, partition coefficients and multimedia partitioning calculations, chemical loss processes, multimedia chemical fate and transport mass balance models of varying complexities, model application to contaminant fate and transport in natural and engineered environmental systems. (3 lecture hours a week.) (Cross-listed with ENVE-8620)

CIVL-8900. Special Topics In Civil Engineering
Selected advanced topics in the field of civil engineering. (3 lecture hours a week.)

CIVL-8960. Major Paper

CIVL-8970. Thesis

CIVL-8800. MEng Research Project
Masters of Engineering student will conduct an investigation, design, and/or analysis, present a progress seminar, and produce a technical report based on their work. Selection of students will be on a competitive basis. (Prerequisite: one CIVL-8XXX level course)

CIVL-9595. PhD Graduate Seminar
PhD Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization, management and leadership. All full-time and part-time PhD students are required to complete 36 hours of graduate seminar classes and give two seminar presentations in the PhD Graduate Seminar course

during their PhD program in Civil Engineering. Students who are not able to complete the PhD Graduate Seminar course have to take an additional 3-credit graduate course approved by their graduate coordinator to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week) (Also offered as ENVE-9595, CIVL-8595, and ENVE-8595)

CIVL-9980. Dissertation

ENVIRONMENTAL ENGINEERING (ENVE-)

Courses offered by Environmental Engineering at the graduate level are listed below. Students may take courses other than Environmental Engineering with permission of the Head of the Department and the advisor.

All courses listed will not necessarily be offered in any given year.

ENVE-8006. Life Cycle Thinking for Engineering Projects
Practical and theoretical applications of life cycle thinking in engineering projects, products, and processes. Understand international standards and methods in Life Cycle Assessment (LCA), Life Cycle Costing (LCC), and Social Life Cycle Assessment (S-LCA). Analyze, interpret, provide critical feedback, and report on claims on sustainability. (Antirequisite: CIVL-8900-49.) (Cross-listed with CIVL-8006 and MECH-8006.) (May be offered as a cross-career course with MECH-4341 (Section 1).

ENVE-8300. Water Pollution Control
Water quality criteria; methods of wastewater disposal and their effects on ecology; theory and design of different unit operations and processes for water purification; theory and design of different design operations and processes of wastewater treatment; reuse and recycling of wastewater. (3 lecture hours a week.)

ENVE-8310. Advanced Water Pollution Control
Discussion on recent advances in the design of water and wastewater treatment plants and new developments in water pollution control practices. (Prerequisite: ENVE-8300 or equivalent.) (3 lecture hours a week.)

ENVE-8330. Solid Waste Management
A study of municipal and industrial solid wastes, quantities, composition, methods of disposal or reclamation; economic viability of the various methods related to the quantities involved. (3 lecture hours a week.)

ENVE-8340. Environmental Separation Processes
Application of the principles of surface chemistry to separation processes involving phase equilibria, ion exchange, membrane separation, adsorption, absorption, flocculation, spherical agglomeration, sedimentation, filtration, and centrifugation. (3 lecture hours a week.)

ENVE-8350. Water Quality Management
Water quality criteria; methods of wastewater disposal and their effects on ecology; stoichiometry, reaction kinetics and material balance; movement of contaminants in water bodies; modelling of water quality in natural systems. (3 lecture hours a week.)

ENVE-8370. Kinetics
Basic concepts of chemical reaction kinetics; characterization of chemical and biochemical systems; reactor flow models and consideration of non-ideality. (3 lecture hours a week.)

ENVE-8380. Biological Treatment of Wastewater
Wastewater characteristics; biological kinetics; flow and loading variation; wastewater treatment processes; mass balances; aeration; sedimentation; lagoons; fixed-film processes; sludge characteristics. (3 lecture hours a week.)

ENVE-8390. Industrial Wastewater Treatment
Sources and characteristics of industrial wastewater; pre-treatment and primary treatment; physical and chemical treatment; biological treatment; waste minimization; treatment of wastes from various industries. (3 lecture hours a week.)

ENVE-8400. Numerical Modeling of Heat and Mass Transfer and Flow in Porous Media
Introduction to finite difference and finite element approaches for simulation of the diffusion and the advection-dispersion equations; development of finite difference formulation of 1-D and 2-D transient heat transfer, nonlinear conductance and source/sinks; 1-D and 2-D mass transport with reaction; 1-D and 2-D heat transfer with finite element approach. (3 lecture hours a week.)

ENVE-8420.Air Pollution Modelling
Air quality standards; emission inventory, source estimation; development of transport models; models with chemical reactions. (3 lecture hours a week.)

ENVE-8440. Climate Change and Infrastructure
Climate change adaptation and mitigation measures. Engineering risk management. Resilience, systems thinking applied to engineered systems. (Cross-listed with CIVL-8441.) (May be offered as a cross-career course with ENVE-4811.)

ENVE-8450. Water and Wastewater Treatment
Water and wastewater quality, guidelines and standards, flow fluctuation and design capacity. Design of different unit operations and processes in water and wastewater treatment. (Cross-listed with CIVL-8450.) (May be offered as a cross-career course with ENVE-3630.)

ENVE-8430. Occupational Hygiene and Pollution Prevention
This course touches on an area of Environmental Engineering not currently covered in detail by other courses: the indoor environment. As well, students are introduced to the definition and methodology of pollution prevention (P2) in industrial settings. Topics include: environmental stressors, provincial and federal regulations, toxicology of contaminants, surveys of workplaces, measurements of airborne contaminants, engineering controls and steps in pollution prevention. (3 lecture hours a week.)

ENVE-8500. Sustainability: Principles and Practices
This course examines the evaluation, design, and management of products, processes, or projects to achieve sustainability. The main topics include: assessing and scoping environmental effects from engineering and other technical activities; eco-balance approaches; life cycle assessment; design-for-environment principles; and decision making for environmental and sustainability objectives. The course will discuss typical examples (e.g., automobiles, infrastructure, electronics), and also draw upon the industrial and research experience and knowledge of the class attendees. Class-based projects will focus on understanding, interpreting, and implementing the knowledge acquired. (3 lecture hours per week.)

ENVE-8595. MASc Graduate Seminar
MASc Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization,

management and leadership. All full-time and part-time MASc students are required to complete 36 hours of graduate seminar classes and give one seminar presentation in the MASc Graduate Seminar course during their MASc program in Environmental Engineering. Students who are not able to complete the MASc Graduate Seminar course have to take an additional 3-credit graduate course approved by their graduate coordinator to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week) (Also offered as CIVL-8595, CIVL-9595, and ENVE-9595).

ENVE-8620. Contaminants Fate and Transport in the Environment
Key environmental media and properties, persistent organic pollutants – chemical classes and properties, real and evaluative environments, partition coefficients and multimedia partitioning calculations, chemical loss processes, multimedia chemical fate and transport mass balance models of varying complexities, model application to contaminant fate and transport in natural and engineered environmental systems. (3 lecture hours a week.) (Cross-listed with CIVL-8620)

ENVE-8660. Solar Energy Engineering
Introduction (history, types, and parts of solar energy collection systems), the solar resource (solar time, angles, shadows, measuring and estimating irradiation), solar thermal collectors (construction, thermal analysis, testing, performance), applications of solar thermal systems (water heating, space heating, industrial applications), photovoltaic system components and sizing, economic analysis. (3 lecture hour/week) (Cross-listed with MECH-8660) (Anti-requisites: ENVE-8990 (27), MECH-8290 (14).

ENVE-8800. MEng Research Course
Masters of Engineering student will conduct an investigation, design, and/or analysis, present a progress seminar, and produce a technical report based on their work. Selection of students will be on a competitive basis. (Prerequisite: one ENVE-8XXX level course)

ENVE-8900. Special Topics in Environmental Engineering
Selected advanced topics in the field of environmental engineering. (3 hours a week.)

ENVE-8960. Major Paper

ENVE-8970. Thesis

ENVE-9595. PhD Graduate Seminar
PhD Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization, management and leadership. All full-time and part-time PhD students are required to complete 36 hours of graduate seminar classes and give two seminar presentations in the PhD Graduate Seminar course during their PhD program in Environmental Engineering. Students who are not able to complete the PhD Graduate Seminar course have to take an additional 3-credit graduate course approved by their graduate coordinator to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week) (Also offered as CIVL-9595, CIVL-8595, and ENVE-8595)

ENVE-9980. Dissertation

ELECTRICAL AND COMPUTER ENGINEERING (ELEC-)

The graduate course offerings in Electrical Engineering are designed to complement the areas of specialization. Course requirements for the PhD, MASc, and MEng. degrees in Electrical Engineering will be selected from the courses listed below and related courses in other programs.

Graduate students will be associated with one of the areas of research. Their program of studies will be formulated in consultation with the graduate advisors and approved by the Chair of the Program Graduate Committee coordinator.

Only a selected number of the courses listed below will be available each year. The current list will be provided by the Coordinator of Graduate Studies in Electrical Engineering.

NOTE: Graduate Student Status is required for all graduate courses in the Department of Electrical and Computer Engineering.

ELEC-8210. Digital Signal Processing
Discrete Signals, discrete system models, z-transforms, Time Domain and Frequency Domain Analysis of Digital Filters, sampling theorem, Design and Realization of FIR and IIR filters, DFT and FFT, Stability and Stabilization of IIR Filters, Design of FIR and IIR Digital Filters Using Non-Linear Optimization Technique, Discrete Hilbert Transform, Sectioned and Fast Convolution, zero padding, digital signal processing applications. (3 lecture hours a week.)

ELEC-8220. Applied Time Signals Analysis and Processing
Continuous and discrete signals; sampling theory and practice; filtering, interpolation, coding, statistical concepts, transform methods; power density estimation, correlation functions, convolution. (3 lecture hours a week.)

ELEC-8230. System Theory
Continuous and discrete time systems, state formulation techniques, controlability and observability concepts, and system simulation. (3 lecture hours a week.)

ELEC-8240. Stochastic Processes
Development and applications of probability models in the analysis of stochastic systems; review of probability, random variables and stochastic processes; correlation functions applications to filtering, prediction, estimation and system identification. (3 lecture hours a week.)

ELEC-8250. 2-Dimensional Digital Signal Processing
Fundamentals of 2-D Signals and Transforms; Z, Fourier, discrete Fourier, etc., 2-D FFT, Design Techniques for 2-D FIR and IIR Digital Filters using Transformation and Optimization Techniques. Stability and Stabilization of 2-D Filters, Homomorphic Filtering, Reconstruction of Signals from their Projections. (3 lecture hours a week.)

ELEC-8270. Speech Processing
Production, perception, and acoustic-phonetic characteristics of speech signal; auditory models; linear prediction of speech; cepstral analysis; speech recognition; speech synthesis; spoken language processing; human-computer communications. (3 lecture hours a week.)

ELEC-8280. Image Processing

This course presents digital and hybrid representation of images, fundamentals of colour, 2-D systems, 2-D filter design and 2-D filtering of digital images, image enhancement techniques: homomorphic filtering, histogram equalization and modification techniques, median and statistical filtering, 2-D FFT algorithms, properties of digital images. Projects are given as a means of learning practical applications of the field. (3 lecture hours per week.)

ELEC-8290. Discrete Transforms and Number Theoretical Methods
Introduction to orthogonal transforms, DFT, DCT, DHT; implementation methods; fast algorithms, FFT, WFT; polynomial transforms; finite rings and fields; number theoretic techniques; residue number systems; conversion and computation; finite polynomial rings; VLSI implementation consideration. (3 lecture hours a week.)

ELEC-8310. VLSI Design
Overview of VLSI designs, CAD tools, application, technology; review of properties of silicon, solid state physics and devices; SPICE models; analog simulation; IC technology; target CMOS process; static CMOS logic; principles of standard cell CMOS design; dynamic characteristics of static CMOS logic; dynamic logic; system level considerations; hardware description languages; silicone compilers. (3 lecture hours a week.)

ELEC-8330. Computational Intelligence
Models of the human brain and sensory systems. Neural networks and learning algorithms. Fuzzy sets, fuzzy logic, and fuzzy systems. Evolutionary computation. Advanced topics in computational intelligence. (3 lecture hours a week.) (May be offered as a cross-career course with ELEC-4370).

ELEC-8340. Advanced Power Systems
Synchronous machine models are developed from the voltage and flux linkage differential equations. Applying the developed models, numerical simulations are performed to determine the dynamic performances of synchronous machines. (3 lecture hours per week.)

ELEC-8350. Nonlinear Systems
Introduction to the analysis and design of nonlinear control systems, mathematical preliminaries, second-order systems (including Lyapunov stability, center manifold theorem, input-output-stability) perturbation theory; control design for non-linear systems. (3 lecture hours a week.)

ELEC-8360. Automotive Control Systems
Introduction to automotive control systems; engine operation and dynamics; engine management and control; robust engine control; hybrid powertrain modelling and control; estimation of vehicle parameters and models; vehicle control system; automotive electronics. (Cross-listed with MECH-8245.)(3 lecture hours a week.)

ELEC-8410. Low Power CMOS Design
This course is designed to prepare students for advanced VLSI design where low power dissipation is of critical concern. Topics will include: Introduction to low power techniques for CMOS circuit design; design levels of abstraction; sources of power dissipation, capacitance analysis, and power estimation; simulation-based and probability-based power estimation; low-level and high-level power optimization; advanced techniques for modern IC fabrication, and low power design tools from an industrial perspective; recent advances in low power CMOS design (3 lecture hours per week plus project.)

ELEC-8500. Adaptive Signal Processing
This course presents topics on optimum linear filtering (Wiener filter, linear prediction, and Kalman filtering), constrained linear estimation, Newton's method, steepest-descent method, stochastic-

gradient algorithms: least-mean-squares (LMS) algorithms, affine projection algorithms (APA), recursive least-squares (RLS) algorithms. Comparative performance analysis of adaptive filters: steady state error, tracking error, convergence rate; finite precision effects. The students are introduced to applications on adaptive noise cancellation, interference canceling, and system identification. (3 lecture hours a week.)

ELEC-8510. Advanced Digital Signal Processing
Review of discrete-time systems and digital filters. Multirate systems including decimatots, interpolators, polyphase decomposition, Nyquist filters, two-channel, and M-channel filter banks. Adaptive equalization including equalization techniques for digital receivers, linear and non-linear equalizers, adaptive algorithms, and blind equalization. Analysis of finite word length effects including coefficient quantization, arithmetic round-off errors, dynamic range scaling, and low-sensitivity digital filter structures. (3 lecture hours a week.)

ELEC-8520. Advanced Topics in Microelectromechanical Systems (MEMS)
Review of advanced topics related to the theory and modeling of MEMS design and fabrication techniques. Topics to be covered include: advanced micromachining techniques, smart microelectromechanical sensing and actuation techniques, microfluidics, photonic MEMS, advanced materials, device modeling, MEMS design case studies, system integration, micro packaging, MEMS design methodology, and reliability issues related to MEMS devices. Emphasis is on theory, lumped element modeling, 3-D multi-domain finite element analysis, static and dynamic device behavior study using industry standard MEMS modeling tools, simulation of fabrication processes using actual fabrication process parameters, and design verification. (3 lecture hours a week.)

ELEC-8530. Analysis of Electrical Machines
This course is concerned with understanding and modeling of induction, reluctance and permanent magnet synchronous generators used in wind power application. In addition, numerical analysis and a review of the basic characteristics used in wind power application. In addition, numerical analysis and a review of the basic characteristics of the above-mentioned electrical machines will be performed. (3 lecture hours a week.)

ELEC-8540. Automotive Sensor Systems
This course describes topics on sensors, optics and lighting, image representation, feature extraction, image analysis, image classification, 3D imaging techniques, GPS, radar, lidar 3D range imaging, intelligent and night vision, sensor integration and fusion. The students will apply their theoretical knowledge to solve a practical problem by completing a course mini-project. (3 lecture hours a week.)

ELEC-8550. Computer Arithmetic
his course presents a detailed description of general class of fixed-radix number systems, floating-point representation, algorithms, and architectures for sequential and fast computation of multiplication, division and square root extraction, elementary functions, logarithmic and residue number systems, finite field arithmetic operations, error control in arithmetic processors. Course assignments and mini-projects on practical aspects of the course are required. (3 lecture hours a week.)

ELEC-8560. Computer Networks
This course will cover concepts and protocols which enable heterogeneous computer networks to work with each other, including transport (TCP, UDP), network (IP, IPng), routing (RIP, OSPF), network management (SNMP, SNMPv2, RMON), and other important protocols like ARP, ICMP, DNS, BOOTP, DHCP and HTTP. Advanced topics like Mobile IP, real-time and reservation protocols (RTP, RSVP), IP multicast (IGMP, MBONE) and network security will also be examined. Emphasis will be on broad coverage, as well as hands-on programming experiences. Local area networks, performance of queueing,

multiple access schemes, IEEE802 standards, wireless LANs and wireless personal area networks will also be covered. (3 lecture hours a week.)

ELEC-8570. Multiuser Detection
This course presents an introduction to multiple-access communication systems: time-division multiple access (TDMA), frequency-division multiple access (FDMA), and code-division multiple access (CDMA); linear receivers for synchronous and asynchronous CDMA systems, blind multiuser detection (direct methods and subspace methods), linear decorrelating and minimum mean-square-error (MMSE) detectors, group-blind multiuser detection in multipath channels, adaptive multiuser detection, space-time multiuser detection, and turbo multiuser detection. Practical applications are demonstrated through course assignments. (3 lecture hours a week.)

ELEC-8580. Network Security
The course presents a concise discussion on the discipline of cryptography- covering algorithms and protocols underlying network security applications, encryption, hash functions, digital signatures, and key exchange. Internet security vulnerabilities, firewalls and their limitations, cryptographic technology and services, PPP and data layer security, IPSec and key management for network layer security, TLS, SSH and transport layer security, secure e-mail, secure infrastructure protocols, Kerberos authentication, secure RPC, remote authentication, authorization and tunneling protocols, virtual private networks, secure remote access, multicast security are covered. Practical applications are covered through assignments. (3 lecture hours a week.)

ELEC-8590. Physical Design Automation for VLSI and FPGAs
Introduction to backend CAD flow for VLSI and FPGAs; algorithms and CAD tools for technology mapping, floor planning, partitioning, placement and routing; exposure to timing analysis and timing-driven layout; assignments will involve use of academic and/or industrial CAD tools as well as development of simple CAD tools for specific layout tasks. (3 lecture hours a week.) (Prerequisites: consent of the instructor.)

ELEC-8600. Reconfigurable Computing
History and evolution of reconfigurable computing (RC) systems; FPGA-based and multi-FPGA systems, CAD mapping tools, run-time reconfiguration, study of recent RC systems from academia and industry targeting a wide range of applications. Literature review and paper presentation on specific topics is also required. The course may require a mix of project and assignments. (3 lecture hours a week.)

ELEC-8610. Statistical Communication Theory
This course describes the fundamentals of Statistical Communications in detail. The topics covered include: hypothesis testing, Bayes and the Neyman-Pearson criteria, minimum variance unbiased estimation, Cramer-Rao bound, sufficient statistics, maximum likelihood estimation, minimum MSE and maximum a posteriori estimation, linear MMSE estimation, detection of signals in white/colored noise, detection of signals with unknown parameters, composite hypothesis testing, generalized likelihood ratio test, sequential detection, and Wald's test. Applications of digital communications, radar/sonar signal processing, seismology, and biomedical engineering are discussed. (3 lecture hours a week.)

ELEC-8620. VLSI Implementation of Digital Signal Processing Systems
The course provides a concise discussion on the various aspects of implementations for DSP algorithms. The course begins with an overview of DSP algorithms. Topics discussed are: implementation platforms, pipelining and parallel processing, systolic architecture, finite word length effects in digital filters, pipelined and parallel filters and adaptive filters, and bit-level arithmetic architectures. (3 lecture hours a week.)

ELEC-8630. Wireless Communication Systems

Overview of mobile communications, the characterization and modeling of time-variant fading and/or dispersive channels, digital communication system performance over fading dispersive channels, diversity reception, optimum receiver, trellis-coded modulation, (fundamentals, performance evaluation and applications to mobile communications), spread spectrum systems, and code division multiple access (CDMA), TDMA, FDMA, multiple access schemes, CSMA, Aloha. Concepts on wireless ad hoc networks will also be introduced, MAC, routing, QoS protocols for these networks will be covered. (3 lecture hours a week.)
(May be offered as a cross-career course with ELEC-4400).

ELEC-8640. RF Integrated Circuit Design
Design of RF integrated circuits for communications systems, matching networks, low noise amplifiers (LNAs), mixers, tuned amplifiers, oscillator design, phase locked loops (PLLs), frequency synthesizers, RF power amplifiers, coupling networks. (3 lecture hours a week.) (Credit cannot be obtained for both ELEC-8640 and it if offered under ELEC-8900 as a Special Topics course.)

ELEC-8650. Introduction to Nano electronic Design
The purpose of this graduate course is to study the emerging nanotechnologies with focus on single-electron tunneling (SET) device and circuit design. It covers various aspects of SET-based nanoelectronic design, including quantum phenomena with nanodevices, I-V characteristics of SET transistors, SET inverters, SIMON simulator, SET-based threshold logic design, hybrid SET-MOS architectures, reliability issues of SET circuits, and SET-based multiple valued logic and memory design. Assigned readings of recent advances in this area (including the instructor's recent research progress) will be actively discussed. The course projects/presentations are usually required. The students are expected to use SIMON tool and/or Cadence tools for circuit simulation. The students should have some background in digital logic design and CMOS integrated circuit design.(3 lecture hours a week.) (Credit cannot be obtained for both ELEC-8650 and it if offered under ELEC-8900 as a Special Topics course.)

ELEC-8660. Data Security and Cryptography
This is an introductory course on the techniques, algorithms, architectures and tools of data security and cryptography. Firstly, the theoretical aspects of data security and cryptographic algorithms and protocols are reviewed. Then we show how these techniques can be integrated to provide solutions to particular data and communication security problems. This course contents are of use to computer and communication engineers who are interested in embedding security services into an information system, and thus, providing integrity, confidentiality and authenticity of the data and the communicating parties.Main contents: classical cryptography techniques; mathematical foundations; secret key cryptography; public key cryptography; authentication and digital signature; network cryptographic protocols.(3 lecture hours a week.) (Credit cannot be obtained for both ELEC-8660 and it if offered under ELEC-8900 as a Special Topics course.)

ELEC-8670. Advanced Analog Integrated Circuit Design
MOS Models for Analog Design, Electronic Noise, Bandgap References, Operational Transconductance Amplifier (OTA) Design, Output Stages, Comparator Design, Sample and Hold Circuits, Analog-to-Digital (A/D) and Digital-to-Analog (D/A) Convertors. (3 lecture hours a week.) (Credit cannot be obtained for both ELEC-8670 and it if offered under ELEC-8900 as a Special Topics course.)

ELEC-8900. Special Topics
Selected advanced topics in a field of research in the Electrical Engineering. (May be repeated more than once for credit if the topics are different.) (3 lecture hours a week.) (Cross-listed with MECH-8290, MECH-8290 and MATL-8890) (May be offered as a cross-career course with ELEC-4190, ELEC-4330, ELEC-4340, ELEC-4350, ELEC-4390, ELEC-4440, ELEC-4470, ELEC-4500 or ELEC-4600, if topics are the same).

ELEC-8960. Major Paper

ELEC-8970. Thesis

ELEC-9980. Dissertation

MECHANICAL, AUTOMOTIVE AND MATERIALS ENGINEERING (MATL-)

Course requirements for the PhD and MASc. programs in Engineering Materials will be selected from the courses listed below and related courses in other programs. A student's course program will be formulated in consultation with the Graduate Studies Committee for Engineering Materials and requires approval of the research advisor and Chair of the Program Graduate Committee. Students will take no more than 2 of the 4 required courses from their supervisor(s).

All courses listed will not necessarily be offered in any given year.

MATL-8801. Advanced Crystallography
Application of X-ray diffraction principles to the study of materials, application of Fourier series, single crystal techniques, studies of preferred orientation, imperfections. (3 lecture hours a week.)

MATL-8802. Phase Transformations
Phenomenological treatment of transformation processes; diffusion controlled and diffusionless (martensitic) transformations; application of thermodynamic and phenomenological rate laws to transformations: nucleation, recrystallization, precipitation, spinoidal decomposition, ordering, eutectoid decomposition, etc. (3 lecture hours a week.)

MATL-8805. Strengthening Mechanisms in Materials
Dislocation-particle interactions, strengthening by dislocation substructures, particle and fiber reinforcement, strong microstructures from the melt, strong microstructures from the solid. (3 lecture hours a week.)

MATL-8806. Microscopy of Materials
The theoretical an technical aspects of the study of microstructure and composition of materials, optical microscopy, electron microscopy (scanning and transmission) including electron diffraction and image analysis principles, electron microanalysis, x-ray topography, field-ion microscopy, relationship of observed microstructures to the macroscopic properties of materials. (2 lecture, 2 laboratory hours a week.)

MATL-8807. Fracture Mechanics
The fracture mechanics approach to design; physical significance of fracture toughness; measurement of fracture mechanics parameters; non-destructive inspection techniques; principles of fracture-safe design; the relation between the microscopic and macroscopic aspects of plane-strain fracture; fracture of specific metallic and non-metallic materials. (3 lecture hours a week.)

MATL-8810.Solidification Fundamentals
Fundamental principles of solidification theory including thermodynamics, kinetics, solid-liquid interface morphology and growth mechanics. Solidification mechanisms of pure metals. Heat flow phenomena in casting and crystal growth. Effect on solidification heat transfer of process variables, casting and mold properties, metal and mold temperatures. Students will apply the fundamentals of thermodynamics and kinetics to materials processes such as casting and welding. (3 lecture hours a week.)

MATL-8811.Casting: Modeling and Simulation
Review of casting fundamentals. Techniques for mathematical model formulation. Development of general numerical method based on control volume finite difference scheme to predict mold filling, heat transfer, and solidification phenomena. Treatment of gates, runners, risers, and overflow. Mesh generation for full casting. Applications using commercial casting-simulation software. Students will

apply their knowledge of engineering mathematics and transport phenomena to the processes of manufacturing light weight automotive components. (3 lecture hours a week.)

MATL-8812.Metal Casting Technology
Introduction and historical overview of casting. Casting processes, mould design and materials, metallurgical simulation. Metallurgical considerations, liquid metal treatment, heat treatment, casting defects and their prevention. Discussion of challenges faced by today's foundries. (3 lecture hours a week.)

MATL-8813.Tribology: Materials and Manufacturing Aspects
This course will prepare students to perform experimental and analytical work on the materials and manufacturing aspects of tribology. Fundamental equations of wear, wear testing methods; micromechanisms of wear, modeling of surface contacts, frictional heating during sliding contact; tribology of internal combustion engines, friction and wear during machining operations; wear control via surface coatings, coatings for cutting tools. (3 lecture hours a week.)

MATL-8890. Special Topics in Materials
Selected advanced topics in the fields of engineered materials and materials Engineering. (3 lecture hours a week.) Current topics include: Creep of Metals and Alloys, Microscopy of Materials II, Wear of Materials, Composite Materials, Fatigue of Metals and Alloys, Polymers, Ceramics, Welding, Materials Degradation, Polymer Injection Molding, Thin Films and Coatings, and, Computational Contact Mechanics in Tribology. (May be offered as a cross-career course with MECH-4871, if topic is the same). (Cross-listed with ELEC-8900 and MECH-8290)

MATL-8970. Thesis

MATL-9980. Dissertation

INDUSTRIAL AND MANUFACTURING ENGINEERING (INDE-)

Students may take courses from outside Industrial and Manufacturing Systems Engineering with permission of the Chair of the Graduate Program and the advisor. All courses listed will not necessarily be offered in any given year.

INDE-8200. Optimization
Classical theory of optimization. Kuhn-Tucker conditions. Unconstrained optimization; gradient methods, conjugate gradient methods, variable metric methods, search techniques. Constrained optimization. Approximation methods, projection methods, reduced gradient methods; penalty function methods; computational algorithms. Recent advances in optimization. Use of computer software packages. (Prerequisite: INDE-3120 or equivalent.) (3 lecture hours a week.)

INDE-8210. Industrial Experimentation and Applied Statistics
Distributions of functions of variables, estimations and tests of hypotheses, power of tests, non-parametric tests, sampling techniques, analysis of variance, randomized blocks. Latin squares and factorial experiments. (Prerequisite: INDE-3270 or equivalent.) (3 lecture hours a week.)

INDE-8220. Manufacturing Systems Simulation
Discrete-event system simulation. Random number generation. Stochastic variate generation. Input parameters; identification and estimation. Output analysis. Static and dynamic output analysis; initial and final conditions; measures of performance and their variance estimation; confidence interval. Design of experiments. Various sampling techniques. Single and multifactor designs. Fractional designs.

Response surfaces. Regeneration method for simulation analysis; Monte Carlo optimization. (3 lecture hours a week.)

INDE-8230. Production and Inventory Control Systems
Analysis of production-inventory systems. Inventory systems; deterministic, single-item and multi-item models; quantity discounts; stochastic, single-period models; periodic review and continuous review models. Production planning. Static demand models; product mix and process selection problems; multi-stage planning problems. Dynamic demand models; multi product and multistage models. Operations scheduling; job shop scheduling; line balancing. New directions in production systems research. (Prerequisite: INDE-4130 or equivalent.) (3 lecture hours a week.)

INDE-8240. Advanced Operations Research I
Theory and computational techniques for solving linear and integer programming problems. Theoretical foundations of the simplex algorithm. Duality and sensitivity analysis. Network flow methods. Integer programming problems. Branch and bound methods, implicit enumeration methods, cutting plane methods. Interior point methods and other recent developments. (Prerequisite: INDE-3120 or equivalent.) (3 lecture hours a week.)

INDE-8250. Advanced Operations Research II
Probabilistic O.R. models. Markovian decision process. Queueing theory. Single channel and multichannel queueing systems. Queues with general arrival and service patterns. Bulk queues and priority queues. Applications of queuing models. Probabilistic dynamic programming. (Prerequisite: INDE-4120 or equivalent.) (3 lecture hours a week.)

INDE-8260. Computer-Aided Modeling of Complex Surfaces
This course provides an understanding of complex surfaces and their applications, design, mathematical modeling and manipulation techniques. It provides a mathematical foundation of sculptured surfaces, with emphasis on NURBS. Topics include: Geometric modeling, Curves and surfaces representation, B-Spline basis functions, Rational B-Splines curves, and surfaces, Construction of NURBS surfaces, Development of prototype complex surfaces using CAD software and MATLAB, and Introduction of reverse engineering of complex surfaces, modeling, manipulation and prototyping. (Prerequisite: INDE-3110 and INDE-3150, or equivalent.) (3.0 Lecture hours per week)

INDE-8270. Advances in Industrial Ergonomics
Ergonomics and work design; human workload measurement in industry; visual display terminals at the workplace; signal detection and visual inspection; user-computer interaction; human factors aspects of flexible manufacturing systems; effects of individual and combined environmental stressors on human performance. (3 lecture hours a week.)

INDE-8280. Reliability Engineering
Basic reliability distributions. Constant failure rate models-exponential reliability function, Poisson process. Time dependent failure models-the Weibull, normal, log-normal distributions. State-dependent systems-Markov analysis. System reliability-system structure function. Reliability growth testing-noon-parametric methods, censored testing and accelerated life-testing. Design for reliability-specification, reliability allocation, failure analysis, system safety. Maintainability and availability. (Prerequisite: INDE-3270) (3 lecture hours a week.)

INDE-8290.Computer-Integrated Manufacturing
Development of CIM; the CIM pyramid-key functions. System integration; standards for communications-MAP Data base as the hub of CIM-types of data base. Role of simulation and support systems-decision

support systems and expert systems. Sensor technology, robot vision, and group technology. Impact of CIM. Factory of the future. (3 lecture hours a week.)

INDE-8300. Advanced Engineering Economy
Principles and methods for engineering analysis of industrial projects and operations. Criteria for economic decisions, project investment analysis, gain and loss estimating and techniques for economic optimization under constraint are included. Emphasis is placed on the construction and use of analytical models in the solution of engineering economy problems. Elements of risk and uncertainty are included through use of probabilistic techniques. (Prerequisite: GENG-3130 or equivalent.) (3 lecture hours a week.)

INDE-8310. Stochastic Processes
Stochastic processes. The Poisson process-relationship to exponential, Erlang and uniform probability distributions. Markov chains-basic limit theorem. Continuous time Markov chains - birth-and-death processes, time-dependent probabilities, limiting probabilities, relationship to the exponential distribution, uniformization. Renewal theory-limit theorems, renewal reward processes, regenerative processes, computing the renewal function. Brownian motion and stationary processes. (Prerequisite: Statistics INDE-4120 or equivalent.) (3 lecture hours a week.)

INDE-8320. Manufacturing Systems Paradigms
The evolution of manufacturing systems paradigms, their drivers, characteristics, prerequisites and operation principles. Variant-oriented systems including Flexible (FMS) and Reconfigurable (RMS) Manufacturing Systems. Industrial revolutions, including I4.0, and future manufacturing systems paradigms. (3 lecture hours a week). (Prerequisite INDE-4310 or equivalent with instructor permission).

INDE-8340.Engineering Design, Methodology and Applications
Engineering Design is a creative, iterative, and often open-ended process subject to constraints. Topics include: design creativity and problem solving, engineering conceptual design and embodiment design, practices for product realization design theories and methodologies, parametric design, probabilistic design, industrial design, design and manufacturing integration, concurrent Engineering, materials selection in design, design for x (e.g. manufacturing, assembly), engineering design communication. Significant time is devoted to the applications of design theories and methodologies and to a product/process design realization. (3 lecture hours a week.)

INDE-8350. Artificial Intelligence Applications in Manufacturing
The objective of this course is to teach graduate students how artificial intelligence techniques can be applied to manufacturing operations. Detailed topics to be discussed in this course include: basic knowledge representation methods and problem solving techniques; different search algorithms; introduction to AI high level languages; introduction to the CLIPS shell; AI application in Design; AI application in Operation Management; AI application in Diagnosis; and, AI application in Control. (3 lecture hours a week.)

INDE-8360.Computer-Aided Design (CAD)
This course will focus on computer-aided methods and applications. The lectures present basic and generic principles and tools, supplemented with significant hands-on practice and engineering applications. Various topics are studied and practiced using CAD/CAE software, such as Engineering design and the role of CAD, geometric modelling systems, representation of curves and surfaces, surface modelling, solid modelling and applications, parametric representations, assembly modelling, computer-aided engineering (CAE) and applications, distributed collaborative design, and digital mock-up. (Prerequisite: INDE-3110 or equivalent.) (2 lecture hours a week and 2 laboratory hours a week.) (Cross-listed with MECH-8290 (Section 9).

INDE-8370. Automotive Assembly Work Measurement

A Graduate study of manufacturing driven product designs, assembled in a human orientated workplace. Learn the science of work measurement to continuously evaluate existing designs against internal and external better practices and utilize insights gained from hands-on product teardowns in the development of innovative patentable ideas and product redesign proposals that support the lean enterprises balance scorecard. (3 lecture hours a week)

INDE-8380. Manufacturing Systems: Modelling, Analysis and Performance Measures
This course is specifically oriented toward performance issues that arise in Automated Manufacturing Systems (AMS). The main goal of this course is to introduce efficient analytical modeling tools. Examples related to serial manufacturing systems, and Flexible Manufacturing Systems will be presented to illustrate the theory and applications of these modeling tools. The reliability and maintainability techniques are also presented and integrated in the design, the analysis and the modeling of AMS. (Prerequisites: INDE-3120.) (3 lecture hours per week.)

INDE-8390. Work Organization: Analysis and Design
Introduction to the applications of organization theory for the analysis and design of work organizations (industrial enterprises). Assessment and improvement of organizations through integration of social and technical systems in order to achieve organizational purpose. Fundamentals of organization structure. Classical organization theories. Group decision processes (group and individual). Organizational culture and ethics. Organizations and manufacturing technology. Management of knowledge workers. Information and communication technologies in program in organizations. Innovation and creativity, change management. Organizational accidents and errors, risk management. Impact of globalization and international environment on organizational strategies. (Prerequisite: Graduate Standing in Engineering or Business) (3 lecture hours per week.)

INDE-8400. Engineering Applications in Health Care
Introduction to the broad range of current technological and organizational issues in health care. Overview of health care industry. Instrumentation for medical diagnostics (biomedical sensors, medical imaging). Medical diagnostics and decision making. Information technology in health care (information systems, electronic medical records). Principles of evidence-based medicine. Medical studies and statistics. Prosthetics and orthotics. Lab automation and surgical robotics. Manufacturing in health care. Health care facilities planning and design. Quality management in health care. (Prerequisites: graduate standing in engineering, business, nursing or human kinetics; 3 lecture hours a week).

INDE-8410. Sustainable Manufacturing
The objective of this course is to introduce students to how the environment has been affected by the activities of the manufacturing industry and how this type of impact could be measured and reduced. Students will learn to identify design and manufacturing issues related to the environment. Topics discussed in this course include sustainable development, sustainability, environmentally conscious design and manufacturing concepts and practices, recycling and reuse, material selection and compatibility, de-manufacturing and re-manufacturing, life-cycle assessment, and ISO 14000. (3 lecture hours per week.)

INDE-8420. Supply Chain Management and Logistics
This course covers the major issues associated with the management of Supply Chain and Logistics, covering both technical and managerial issues with emphasis on the analytical decision support methods and tools. Topics include supply chain network design, inventory models and theories, transportation and logistics planning, outsourcing and pricing, and case study. (Prerequisite: INDE-3120 or INDE-3910, or equivalent) (3 lecture hours per week.)

INDE-8430. Product Innovation and Design Management

This course covers the critical factors affecting product development and innovation and identifies the common characteristics of successful new products drawing upon best industrial practice. The aim is to provide students with an understanding of the managerial and technical processes commonly involved in product development and innovation. Three main themes will be covered throughout this course: Product Design and Innovation; Idea Generation Techniques; Design and Innovation Project Management. (3 lecture hours per week.)

INDE-8440. Advanced Topics in Discrete Optimization
This course is concerned with topics in discrete optimization, particularly in integer programming theory and techniques. Topics include: Analysis of algorithms, modeling and applications of discrete optimization, dynamic programming, branch and cut, Lagrangian duality, modern meta-heuristic methods, introductions to nonlinear integer programming and stochastic (integer) programming, software for solving discrete program, advances in discrete optimization. (Prerequisite: INDE-3120 or equivalent.) (3 lecture hours per week.)

INDE-8450. Products Variety Management
Products variety types, sources and implications; design for variety (DFV); modularity; design structural matrices; products grouping, families and platforms; mass customization and personalization; and variety-oriented manufacturing systems. (3 lecture hours/week). (Pre-requisite: INDE-4310 or equivalent with instructor permission).

INDE-8460. Advanced Manufacturing
This course is an advanced manufacturing course with an emphasis on computer aided machining (CAM). Topics include: practices for product realization, advanced manufacturing processes, CNC programming and virtual manufacturing, and process planning using advanced CAD/CAM tools. It is expected that the students will have strong CAD skills, and an understanding of traditional manufacturing processes as prerequisites. Throughout the course, the students will be engaged with individual mini projects after they learn core materials from online teaching tools developed by Autodesk (Pre-requisite: INDE-3110 or INDE-8360 or equivalent CAD course; INDE-3210 or equivalent undergraduate Manufacturing Processes course; or instructor permission) (Cross-listing: MECH-8250.)

INDE-8595. MASc Graduate Seminar
The MASc Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering and research related topics and technical communication. All full-time and part-time students are required to register in it throughout their program, attend no less than 75% of all seminars, and give a presentation (normally in the final year of their degree). This course will be graded on a Pass/Fail basis. (1 lecture hour a week.) Units: 0 units (Non-credit course.)

INDE-8900. Special Topics
Selected advanced topics in the field of Industrial Engineering. (3 lecture hours a week.)

INDE-8960. Major Paper

INDE-8970. Thesis

INDE-9695. PhD Graduate Seminar
The PhD Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering and research related topics and technical communication. All full-time and part-time students are required to register in it throughout their program, and give 2 presentations. Students are required to attend no less than 75% of all seminars. This seminar course will be graded on a Pass/Fail basis. (1 lecture hour/week). Units: 0 units (Non-credit course.)

INDE-9980. Dissertation

MECHANICAL ENGINEERING (MECH-)

Course requirements for the PhD., MASc. and M.Eng. programs in Mechanical Engineering will be selected from the courses listed below and related courses in other programs. A student's course program will be formulated in consultation with the advisor and requires approval of the Graduate Studies Committee for Mechanical Engineering and the Chair of the Program Graduate Committee.

With the permission of the advisor and Department Head (and under consultation with the Graduate Coordinator), Mechanical Engineering courses with numbers greater than 4490 only and related to the graduate field of study may be taken for graduate credit for students enrolled in the MASc and M.Eng. programs. Not more than one undergraduate course (numbered greater than 4490 only) shall count as credit towards the course requirements for the MASc or MEng. degree. These courses are not available for course credit towards the PhD. degree. In the case of MEng. students, the Chair of the Graduate Committee assumes the role of the advisor.

MECH-8000. Special Topics in Automotive Engineering
Selected advanced topics in the field of automotive engineering.

MECH-8006. Life Cycle Thinking for Engineering Projects
Practical and theoretical applications of life cycle thinking in engineering projects, products, and processes. Understand international standards and methods in Life Cycle Assessment (LCA), Life Cycle Costing (LCC), and Social Life Cycle Assessment (S-LCA). Analyze, interpret, provide critical feedback, and report on claims on sustainability. (Anti-requisite: CIVL-8900-49.) (Cross-listed with CIVL-8006 and ENVE-8006.) (May be offered as a cross-career course with MECH-4341 (Section 1).

MECH-8011. Bluff Body Aerodynamics
Atmospheric boundary layers. Flow around bluff bodies, separation and wakes. Lift and drag, pressure and force coefficients. Streamlined bodies, bluff bodies. Flow over flat plates and walls, rectangular prismatic shapes, circular cylinders. Fluctuating forces and pressures on bluff bodies. Wind tunnel testing, similarity requirements, wind tunnel techniques. Vehicle aerodynamics, drag and lift of passenger cars, cross wind stability, wind tunnel and road testing. Architectural aerodynamics, design wind speed, flow in and around building, wind-induced response of low-rise buildings, tall buildings, and large roof and sports stadium. Aerodynamics of Wind Turbines. (Prerequisite: Undergraduate level Engineering Mechanics, Fluid Mechanics.)

MECH-8029. Automotive Paint and Industrial Coatings
This course covers: functionality and application methods of automotive coating layers, concepts in polymer chemistry and suspensions, automotive coatings formulation, application of coatings by dip and spray processes, curing of coatings after application, appearance measurement and durability testing. Concepts of adhesion, corrosion resistance and surface pretreatment will also be covered. Powder coating and coating plastics. Each student will complete a literature review of a topic in coatings. (Anti-requisite: ENVE-8900 Pollution Prevention in Manufacturing.)

MECH-8091. Engineering Venture Formation
Designed for students who choose entrepreneurship as a career option, this course is an in-depth study of the process of drawing the blueprints for a new enterprise including: developing business ideas, developing business concepts, conducting feasibility studies, choosing a legal form or business, writing business plans, identifying and approaching sources of money, raising funds, and putting together a package of resources to start an enterprise. (Anti-requisites: STEN-4910.)

MECH-8203. Turbulent Flow

General turbulence theories, wall turbulence and free turbulence. (3 lecture hours a week.)

MECH-8206. Thermal Systems Design
Advanced systems design requiring the application of economics, heat transfer, simulation and optimization. (3 lecture hours a week.)

MECH-8207. Experimental Techniques in Flow Measurements
A course covering the theory of flow and velocity measurement. Emphasis will be placed on hot wire instruments and turbulence measurements. (3 lecture hours a week.)

MECH-8209. Multiphase, Multicomponent Flows
A thorough treatment of the basic techniques for analyzing one-dimensional multi-phase, multicomponent flows in order to predict flow regimes, pressure drop, etc. Practical applications in fluidization, sedimentation and boiling heat transfer. (3 lecture hours a week.)

MECH-8216. Industrial and Motor Vehicle Noise
Hearing damage risk criteria and in-plant noise regulations; determination of permissible exposure levels due to continuous and intermittent noise. Measurement of machine noise and standard procedures. Fundamentals of noise control. Characteristics and levels of motor vehicle and traffic noise; motor vehicle noise control legislation and standard procedures for measurement. (3 lecture hours a week.)

MECH-8217. Automotive Applications for Noise, Vibration and Harshness Evaluation
This course introduces the automotive applications and tools for the evaluation of noise, vibration and harshness. It includes reviews of measurement techniques presently used in the automotive industry to measure various aspects of noise, including the concept of sound quality, vibration and the quantification of the term harshness. The course consists of a review of papers which are to be presented to the class. Participants perform critical reviews on the presentations. Three lecture hours per week. Course evaluation is based on weekly reports, presentations of reviews of papers and critical reviews by participants. (3 lecture hours a week.)

MECH-8230.Combustion Engineering
An introductory graduate course on combustion engineering, covering a broad range of topics of importance to the field including chemical thermodynamics and kinetics, flames and combustion rates, and detonation of gaseous mixtures. The emphasis is on the understanding of the combustion processes involved in practical systems. (Anti-requisite: MECH-8290, section 1.) (3 lecture hours a week.)

MECH-8231.Numerical Heat Transfer and Fluid Flow
This course is concerned with the ability of using numerical methods to predict heat transfer, fluid flow and related processes. The course consists of an introduction to Computational Fluid Dynamics, descriptions of the general governing differential equations, discretization methods for the differential equations, numerical simulation of conductive heat transfer, numerical treatment of convection and diffusion and calculations of flow fields. (Anti-requisite: MECH-8290, section 2.) (3 lecture hours a week.)

MECH-8232.Modeling of Thermo-fluid Systems
This course will cover the basic types of mathematical models that are used to describe Thermo-fluid systems. Lumped as well as distributed parameter models will be considered with analytical as well as numerical methods of solution. Modern solution tools such as Simulink, Maple, Fluent and Wave will be utilized whenever appropriate. The topics to be considered may include but are not limited to: two-phase flow, transient flow, turbulence, non-newtonian flow, boiling, evaporation, condensation and fluid-structure interaction. (Anti-requisite: MECH-8290, section 7.) (3 lecture hours a week.)

MECH-8233. Turbulent Reacting Flows
This course will cover the following topics: experimental investigation of flames, thermodynamics of combustion processes, transport phenomena, chemical kinetics, reactions mechanism, laminar premixed and diffusion flames, the Navier-Stokes equations for the reacting flows, turbulent premixed and non-premixed flames, low temperature oxidation and engine knock, and pollutants formation. (Antirequisite: MECH-8290, section 8.) (3 lecture hours a week.)

MECH-8234. Introduction to Computational Fluid Dynamics
This course is intended to provide basic knowledge required to initiate research or applications in computational fluid dynamics. Topics include: numerical methods for model hyperbolic, parabolic and elliptic equations; analysis of difference schemes; numerical stability; explicit and implicit methods; artificial viscosity; linearization techniques; approximate factorization; preconditioning, iterative solutions, successive over-relaxation (SOR), successive line over-relaxation (SLOR), alternating direction implicit (ADI); two-dimensional structured grid generation; introduction to finite volume method. (3 lecture hours a week.)

MECH-8235. Advanced Topics in Computational Fluid Dynamics
This course is a continuation of MECH-8234. Advanced topics in computational fluid dynamics (CFD) will be discussed, including: structured and unstructured grid generation on surfaces and three-dimensional; Navier-Stokes and Euler solvers; applications of finite volume method; turbulence modeling; current issues in CFD. Students will carry out project work using one or more commercial CFD packages.(Prerequisite: MECH-8234.) (3 lecture hours a week.)

MECH-8236. Fundamentals Of Clean Engine Technology
This course focusses on the understanding of fuel properties, combustion processes, exhaust emissions, and pollution prevention in diesel and other lean-burn IC engines. Introduction to Stirling and other external combustion engines.

MECH-8240. Applied Finite Element Analysis
This course focuses on the modeling aspects of the finite element method using three well known commercial Finite Element Analysis (FEA) software packages known as DYNA, IDEAS and ANSYS. A variety of stress analysis problems in two and three dimensions are studied and the accuracy of the simulations are assessed through comparison with available theoretical and experimental results. Both static and dynamic situations are covered. The students are expected to prepare a final report summarizing their work and an oral presentation. (Antirequisite: MECH-8290, section 3.) (3 lecture hours a week.)

MECH-8241.Introduction to Vibration Measurement and Modal Analysis
This course is concerned with basic concepts of modal theory, basic modal parameter analysis, single degree of freedom methods, introduction to frequency response functions, general modal analysis and multiple degree of freedom and global methods. The accuracy of Fast Fourier Transforms (FFT) and windowing, FFT analysis options, zoom, coherence and quality assessment, relationship to finite element modeling will also be considered. In addition, basic measurement techniques, calibration techniques, transient and steady state excitation techniques, general frequency response function interpretation, case study (laboratory experiment) and validation of measured and analyzed data are studied. (Anti-requisite: MECH-8290, section 4.) (3 lecture hours a week.)

MECH-8242.Advanced Topics in Mechanical Design
The topics discussed in the course will be selected from the following: design and analysis of mechanical details such as welded and bonded joints, minimum constraint design, fluid power systems, mobile hydraulic systems, project planning, optimization, decision making methodology, ISO/QS9000 quality

methods, concurrent engineering, design reports, design reviews, design for manufacture and assembly, design for quality, configuration design, design for minimum cost, parametric design, developing size ranges for families of products, geometric dimensioning and tolerancing, Taguchi methods, manufacturability and serviceability considerations and product warranties. (Anti-requisite: MECH-8290, section 5.) (3 lecture hours a week.)

MECH-8243.Product Design and Development
This course covers the process of new product creation including topics selected from: the product development team; the product development cycle; conceptual development; models including technology push products; platform products; process-intensive products and customized products; needs analysis - identifying the customer and their needs; establishing product specifications; concept generation; concept selection; product architecture; industrial design and ergonomics; prototyping; economics of the development process and project management. (Anti-requisite: MECH-8290, section 6.) (3 lecture hours a week.)

MECH-8244.Finite Element Methods for Crashworthiness and Impact Analysis
The topics include a brief history on the use of numerical tools in automotive/impact field, Explicit and Implicit time integration techniques, Shell and Solid finite element formulations for impact analyses - advantages and disadvantages, Zero Energy Modes (Hour glassing) and Hourglass control, Material modeling for large displacement problems, Finite element modeling for contact, Mesh Adaptivity, Arbitrary Lagrangian and Eulerian Meshes for large deformation problems, Use of implicit integration techniques for impact problems, Quasistatic simulations as well as the development of finite element models for impact analyses. (Anti-requisite: MECH-8290, section 12.) (3 lecture hours a week.)

MECH-8245.Automotive Control Systems
This course will address advanced control design techniques for automotive systems. The interdisciplinary goal of this course is to present the application of control system design to engine operation and vehicle mechanics as well as the approaches for parameter/model identification and estimation of automotive systems. For graduate students in electrical engineering, this course will make it possible for them to access automotive models and to understand engine dynamics, both for the purposes of applying control design techniques. For graduate students in mechanical engineering, this course will provide a chance for them to learn how to apply advanced control design strategies to automotive systems. It is expected that, after taking this course, graduate students from both engineering fields will be able to address automotive control problems from interdisciplinary point of views and to complement expertise in their own areas. (Prerequisite: MECH-4212.) (Anti-requisite: MECH-8290, section 22.) (Cross-listed with ELEC-8360.) (3 lecture hours a week.)

MECH-8250. Advanced Manufacturing
This course is an advanced manufacturing course with an emphasis on computer aided machining (CAM). Topics include: practices for product realization, advanced manufacturing processes, CNC programming and virtual manufacturing, and process planning using advanced CAD/CAM tools. It is expected that the students will have strong CAD skills, and an understanding of traditional manufacturing processes as prerequisites. Throughout the course, the students will be engaged with individual mini projects after they learn core materials from online teaching tools developed by Autodesk (Pre-requisite: MECH-2230 or INDE-8360 or equivalent CAD courses; INDE-3210 or equivalent undergraduate Manufacturing Processes course; or instructor permission.)(Cross-listed: INDE-8460.)

MECH-8290. Directed Special Studies
A special course of studies with content and direction approved by the student's chief advisor. Although there may not be formal lectures, the course will carry the weight of three lecture hours. (Cross-listed with ELEC-8900 and MATL-8890)

MECH-8293.Introduction to Finite Element Analysis
This course covers the fundamentals of the Finite Element Analysis (FEA) with emphasis on solid mechanics and stress analysis. The subject of finite elements is treated using variational principles such as the principle of virtual work and total potential energy. The course deals with a variety of structural components such as springs, axially loaded bars, beams under bending, two-dimensional/axially symmetric/three-dimensional continuum elements and their formulation is static and dynamic analysis. In addition to three hours of lecture, a two-hour computer lab is mandatory where the students use different commercial FEA software. (3 lecture hours a week and 2 laboratory hours a week.)

MECH-8295. MASc Graduate Seminar:
MASc Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization, management and leadership. All full-time and part-time MASc students are required to complete 36 hours of graduate seminar classes and give one seminar presentation in the MASc Graduate Seminar course during each of his/her graduate degree programs in Mechanical Engineering. Part-time students who are not able to take the MASc Graduate Seminar course have to take an additional 3-credit graduate course approved by his/her degree supervisor(s), if necessary, to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week) (Cross-listed with MECH-9295).

MECH-8960. Major Paper

MECH-8970. Thesis

MECH-9295. PhD Graduate Seminar
PhD Graduate Seminar is a series of presentations by graduate students, faculty and invited speakers on engineering related topics, including but not limited to research, development, commercialization, management and leadership. All full-time and part-time PhD students are required to complete 36 hours of graduate seminar classes and give two seminar presentations in the PhD Graduate Seminar course during each of his/her graduate degree programs in Mechanical Engineering. Part-time students who are not able to take the PhD Graduate Seminar course have to take an additional 3-credit graduate course approved by his/her degree supervisor(s), if necessary, to fulfill the overall credit requirement for the degree. This seminar course will be graded on a pass/fail basis. (1 lecture hour/week)

MECH-9980. Dissertation

AUTOMOTIVE ENGINEERING COURSES (AUTO-)

AUTO-8010. Mobility and Society
The course will provide insights into societal contexts and issues related to road vehicle transportation, economics, and the changes to society and infrastructure caused by the mass adoption of electric vehicles and ubiquitous charging systems. EDI and ID-related topics such as Canada's interactions with its Indigenous peoples and broader societal and cultural issues such as urbanization, demographics will be examined in the context of the needs of all people for safe, reliable, and affordable transportation while reviewing the life-cycle analysis and impact of EVs on sustainability, the environment and public infrastructure such as charging and hydrogen fueling systems for fuel cells. This course will examine these topics in a manner that promotes student's ability to clearly and concisely communicate (verbally, in written and mathematical formats), from the viewpoint of an engineer.

AUTO-8020. Vehicle Systems

Introduction to primary automotive systems including engine types and configurations, vehicle dynamics, powertrain and vehicle propulsion. Advanced driver assist systems (ADAS), tractive effort, energy requirements, vehicle duty cycles and usage patterns, propulsion system efficiency, regenerative braking systems, emission, and fuel economy standards as they relate to internal combustion, electric, hybrid, hydrogen fuel cell electric propulsion systems and the relative merits of each will be incorporated. Identification and discussion of industry issues and trends including vehicle safety standards (FMVSS/CMVSS, NCAP and ECE, for example) and emerging technologies and standards (i.e. SAEJ1772, J3400 (NACS), SAE J2601and ISO-26262)

AUTO-8030. Engineering Project Management, Automotive Lean and Quality Processes
This course will examine the basic principles and tools used in engineering project management through topics such as project scope definition, consideration of time, cost, risk, procurement, and stakeholder management. The course will also review topics associated with the principles of process management used in lean manufacturing (the 5 Lean Principles, House of Value and 6S attributes) and specialized automotive quality processes such as design failure modes and effects analysis (DFMEA), production part approval process (PPAP). and advanced product quality planning (APQP) that are used in the auto industry to ensure on-time delivery of the right product with the right attributes, overall product quality and sound financial management of product development processes. Principles, methods, and best practices (such as life cycle analysis), Poka-Yoke design, design for manufacturability and assembly (DFMA) that are used by industry to reduce waste and operate more efficiently will also be covered.

AUTO-8040. Vehicle Propulsion
This course will provide an examination of propulsion systems such as clean burning IC engine propulsion, electric vehicle (EV) propulsion (battery, hybrid, plug-in hybrid) and fuel cell electric vehicle propulsion. Topics will include combustion processes and pollution prevention for IC engines, and chemical and material properties and processes for electric propulsion along with key performance metrics. Charging systems and their integration with, and influence on, the electric power grid and potential future developments will be reviewed.

AUTO-8050. Vehicle Energy and Thermal Management
This course will examine control of the passenger compartment environment, occupant comfort and powertrain thermal management for different types of propulsion (i.e. internal combustion engines, battery electric motors, hybrid, and hydrogen fuel cells) along with energy management topics as it relates to vehicle energy and thermal management. Software will be introduced to aid with system and component sizing and performance calculations

AUTO-8060. Powertrain Systems
This course will provide an in-depth examination of vehicle electric drive systems including e-motors and motor controllers operating at different voltage levels, various types of batteries, (cell formats and chemistries and new concepts such as solid state batteries) and performance metrics including cruise and acceleration, range calculations and influences on each component using representative software to model E-motor materials, magnet design, gearboxes, EV powertrain component manufacturing processes, on-board safety and safety in energy storage for EV and hydrogen as well as component manufacturing, will also be discussed.

AUTO-8070. Manufacturing and Robotic Fundamentals
This course introduces the basics of robotically assisted manufacturing by examining the modeling, design, planning, and control of robot and manufacturing systems. Global robotic specifications will be introduced at a high level. Students will also learn to develop multiple robot work-cells as an introduction to dexterous manipulation (DM) using an advanced DM work-cell design.

AUTO-8015. Automotive Body Structures and Components
This course will look at body and chassis types, construction methods and materials including steel, aluminum, magnesium, fiberglass and carbon fibre and the relative merits of each including basic calculations. It will include structural analysis using finite element analysis (FEA) software. The rationale for the use of various materials and their relative merits including cost, weight, manufacturability, and properties will be discussed. The influence on occupant safety, comfort, and vehicle acoustics (NVH), ride and handling, crashworthiness, and durability of different types of vehicle powertrain components, battery packs and vehicle payloads will also be described.

AUTO-8025. Sensors and Controls of EVs
Connected, autonomous, secure, and electric vehicles require an extensive suite of sensors, software, and controls for safe, efficient, and reliable operation. This course examines advanced driver assist systems, SAE J1939 CAN Bus communications, high voltage interlock loop (HVIL) safety systems, sensors, optics & lighting, image representation, feature extraction, image analysis, image classification, 3D imaging techniques, GPS, radar, lidar 3D range imaging, intelligent and night vision, sensor integration and fusion.

GENERAL ENGINEERING COURSES (GENG-)

GENG-8000. Engineering Technical Communications
Engineering Technical Communications will prepare Master of Engineering (MEng) students to communicate technical information clearly and concisely, in written, oral, and graphical form. Students will work through a logical thought process for organizing advanced concepts as well as practice technical writing styles to effectively write and organize advanced technical papers for presentation and publication. Students will also work in teams to prepare written technical papers and will present this information as part of a major project. (Open to Masters of Engineering students, excluding students in the MEng Auto Program. Open to engineering MASc/PhD students on permission of the department/faculty as a qualifying course only. Will not count for credit towards MASc/PhD degree.)

GENG-8010. Engineering Mathematics
The course will cover topics in advanced modern engineering mathematics not addressed in earlier courses and considered to be crucial for more advanced engineering courses at the graduate level. These topics include: Fourier series and Fourier transforms, with applications in the frequency domain modelling, solution of partial differential equations with applications in continuum mechanicals and electromagnetism, solution of integral equations with applications in acoustics and aerodynamics. (Open to Masters of Engineering students, excluding students in the MEng Auto Program. Open to engineering MASc/PhD students on permission of the department/faculty as a qualifying course only. Will not count for credit towards MASc/PhD degree).

GENG-8020. Engineering Project Management
This course will expose students to principles, concepts, and tools utilized in project management activities. This course will include topics such as defining project scope, and time, cost, risk, procurement and stakeholder management. The students will be engaged in working on a major project to develop proficiency in project management activities and tools. (Open to Masters of Engineering and Masters of Engineering Management students, excluding students in the MEng Auto Program. Open to engineering MASc/PhD students on permission of the department/faculty as a qualifying course only. Will not count for credit towards MASc/PhD degree.

GENG-8030. Computational Methods and Modeling for Engineering Applications
This course covers the basics of computational analysis for real-world engineering applications. Students will learn the fundamentals of programming and modeling with MATLAB. Topics include: Computational

Methods, Model Building, for Engineering Projects, Hardware for Real-time Testing, Data Acquisition from Sensors. Students will complete a real-world project in the areas of their interests.

GENG-8040. Engineering Management Capstone
This is a jointly instructed and administered course between the Faculty of Engineering and the Odette School of Business. The course is the last course students take in the Master of Engineering Management program and has mandatory prerequisites. The goal is to allow students to practice all business and management theory they learned in previous courses by completing one of: 1) an engineering management report 2) an engineering feasibility study, or 3) a new venture business plan. This course is entirely project-based. (Prerequisites: All 6 mandatory core courses within the MEM program) (2 semester, 6.0 credit course) (Cross-listed with Business BUSI-8400)

GENG-8050. Data Analytics and Decision-Making
This course introduces fundamental concepts of data analytics and their application in decision making. The emphasis is on the utilization of practical analytics tools in a complex engineering management environment. Topics covered may include: development and validation of decision-making models, data-based decision-making skills, decision variables and constraints identification, sensitivity analysis, optimization and predictive analysis. Students in this class will learn how to make evidence-based management decisions and develop recommendations based on data.

GENG-8060. Strategic Entrepreneurial Management
This course introduces the basic principles and techniques of start-up creation. The focus of the course is on nurturing the skills required to develop a successful business model for a new venture. First, students learn to assess the commercial viability of a new product or service. Then, they learn techniques to identify and validate the key value propositions for a start-up. They also employ the lean startup methodologies to define and segment the market, identify adequate revenue streams, and assess distribution channels. Also, students learn how to design and develop a minimum viable product and identify risks associated with market entry. Finally, students explore the financial and legal aspects of a startup. Attention is also given to aspects of sustainability, diversity, and ethics. (Restricted to students in the Master of Engineering Management program.) (Cross-listed with INDE-8900 (Section 1).

FACULTY OF HUMAN KINETICS

PROGRAMS

Master of Science (Kinesiology and Health Studies)

(Thesis and Internship)

Admission Requirement

Applicants must have:

- A 4-year Bachelor's degree in Kinesiology
- and Health Studies, or related field
- A minimum cumulative GPA of 70% or better in the final two years of study (full-time equivalent)
- A faculty supervisor
- Two academic letters of reference (e.g., course instructor)
- The MSc(KHS) Supplementary Admissions Form
- For applicants whose native language is not English, one of the following the minimum scores required are:
  - TOEFL: IBT – 100
  - IELTS: 7.0
  - Pearson: 68
  - CAEL: 70
  - Duolingo English Test (DET): 130
  - Cambridge English: Advanced (CEA) or Cambridge English: Proficiency (CEP): 185

Program Requirements (Thesis)

1.Three courses from:
KINE-8000. Sport Leadership
KINE-8020. Organizational Behaviour in Sport Organizations
KINE-8040. Advanced Topics in the Psychology of Sport and Exercise
KINE-8050. Social Issues in Sport Management
KINE-8070. Quantitative Analysis in Kinesiology
KINE-8100. Directed Study*
KINE-8110. Group Dynamics in Sport and Exercise
KINE-8210. Clinical Exercise Physiology
KINE-8220. Instrumentation and Modeling in Kinesiology
KINE-8230. Applied Biomechanics of Human Performance
KINE-8240. Biomechanics in the Work Place
KINE-8250. Motor Skill Acquisition
KINE-8260. Motor Control of Human Performance
KINE-8270. Advanced Exercise Assessment
KINE-8280. Neuromuscular Physiology
KINE-8290. The Physiology of Sex Differences in Sport, Exercise and Health

KINE-8300. Skeletal Muscle Pathophysiology
KINE-8310. Healthy Aging
KINE-8620. Research Methods
KINE-8630. RStudio for Data Science
KINE-8940. Selected Topics
2. KINE-8970. Thesis
3. One other graduate course chosen in consultation with the thesis advisor (may be a senior undergraduate course)

*Note: Only one Directed Study (KINE-8100) may be taken.

Program Requirements (Internship)

1. Five courses from:
KINE-8000. Sport Leadership
KINE-8020. Organizational Behavior in Sport Organizations
KINE-8040. Advanced Topics in the Psychology of Sport and Exercise
KINE-8050. Social Issues in Sport Management
KINE-8070. Quantitative Analysis in Kinesiology
KINE-8100. Directed Study*
KINE-8110. Group Dynamics in Sport and Exercise
KINE-8210. Clinical Exercise Physiology
KINE-8220. Instrumentation and Modeling in Kinesiology
KINE-8230. Applied Biomechanics of Human Performance
KINE-8240. Biomechanics in the Work Place
KINE-8250. Motor Skill Acquisition
KINE-8260. Motor Control of Human Performance
KINE-8270. Advanced Exercise Assessment
KINE-8280. Neuromuscular Physiology
KINE-8290. The Physiology of Sex Differences in Sport, Exercise and Health
KINE-8300. Skeletal Muscle Pathophysiology
KINE-8310. Healthy Aging
KINE-8620. Research Methods
KINE-8630. RStudio for Data Science
KINE-8940. Selected Topics

2. KINE-8950. Internship
3. Two other graduate courses chosen in consultation with the thesis advisor (may be a senior undergraduate course)

*Note: Only one Directed Study (KINE-8100) may be taken.

Master of Sport Management and Leadership (MSML) (Thesis)

Admission Requirements

Applicants must have:
- A 4-year Bachelor's degree in Sport Management and Leadership, or related field
- A minimum cumulative GPA of 70% or better in the final two years of study (full-time equivalent)
- A faculty supervisor
- Two academic letters of reference (e.g., course instructor)

- The MSML Thesis Supplementary Admissions Form
- For applicants whose native language is not English, one of the following the minimum scores required are:
  - TOEFL: IBT – 100
  - IELTS: 7.0
  - Pearson: 68
  - CAEL: 70
  - Duolingo English Test (DET): 130
  - Cambridge English: Advanced (CEA) or Cambridge English: Proficiency (CEP): 185

Program Requirements Thesis:

1. Two courses from:
   KINE-8000. Sport Leadership
   KINE-8020. Organizational Behaviour in Sport Organizations
   KINE-8030. Sport Marketing
   KINE-8050. Social Issues in Sport Management
   KINE-8060. Crises, Politics and Commercialism in the Modern Olympic Movement
   KINE-8070. Quantitative Analysis in Kinesiology
   KINE-8080. Strategic Management in the Sport Industry
   KINE-8090. Newsroom
   KINE-8100. Directed Study*
   KINE-8110. Group Dynamics in Sport and Exercise
   KINE-8310. Healthy Aging
   KINE-8940. Selected Topics
2. Research Methods (KINE-8620)
3. Thesis (KINE-8970)
4. One other graduate course chosen in consultation with the thesis advisor (may be a senior undergraduate course)

*Note: Only one Directed Study (KINE-8100) may be taken.

Master of Sport Management and Leadership (MSML) (Internship)

Admission Requirements

Applicants must have:

- A 4-year Bachelor's degree in Sport Management and Leadership, or related field
- A minimum cumulative GPA of 70% or better in the final two years of study (full-time equivalent)
- Two academic letters of reference (e.g., course instructor)
- The MSML Internship Supplementary Admissions Form
- Resume
- For applicants whose native language is not English, one of the following the minimum scores required are:
  - TOEFL: IBT – 100
  - IELTS: 7.0
  - Pearson: 68
  - CAEL: 70
  - Duolingo English Test (DET): 130
  - Cambridge English: Advanced (CEA) or Cambridge English: Proficiency (CEP): 185

Selection criteria will include a weighted score for: (1) undergraduate academic performance; (2) strength of references; and (3) prior training, experience, and accomplishments. Applicants will be reviewed and assessed for eligibility by the admissions committee for the program, which will be composed of faculty teaching in the program and the Associate Dean of Research and Graduate Studies. Enrolment will be limited due to experiential spaces available in KINE 8980.

Program Requirements Internship:

1. Required Courses (Take ALL):
   KINE-8620. Research Methods
   KINE-8050. Social Issues in Sport Management
   KINE-8980. Internship in Sport Management and Leadership
   KINE-8990. Critical Reflections and Industry Insights in Sport Management and Leadership
2. MSML Electives I (Take 2):
   KINE-8000. Sport Leadership
   KINE-8020. Organizational Behaviour in Sport Organizations
   KINE-8030. Sport Marketing
   KINE-8080. Strategic Management in the Sport Industry
3. MSML Electives II (Take 1):
   KINE-8060. Crises, Politics and Commercialism in the Modern Olympic Movement
   KINE-8090. Newsroom
4. One other 8000-level Kinesiology course from KINE-8070, KINE-8100, KINE-8110, KINE-8310, KINE-8630, KINE-8940 or a course not taken to fulfill requirements under (2) or (3)*

*Note: Course in (4) may be a senior undergraduate course.

PhD in Kinesiology

Admission Requirements

Applicants must have:
- A master's degree in Kinesiology and Health Studies or Sport Management and Leadership, or related field
- A minimum cumulative GPA of 77% (or equivalent) in their master's program
- A faculty supervisor
- Three letters of reference (a minimum of two academic references; it is recommended that one academic reference be provided by the applicant's master's supervisor)
- Letter indicating the proposed field of study
- A personal statement of interest
- Sample of written work (e.g., term paper, thesis proposal, published work)
- Resume or curriculum vitae (CV)
- For applicants whose native language is not English, one of the following the minimum scores required are:
  - TOEFL: IBT – 100 (no sub-section lower than 22)
  - IELTS: 7.0 (no individual band lower than 6.5)
  - Pearson: 68 (no sub-section lower than 58)
  - CAEL: 70 (no sub-section lower than 60)
  - Duolingo English Test (DET): 130 (no sub-section lower than 120)
  - Cambridge English: Advanced (CEA) or Cambridge English: Proficiency (CEP): 185 (no subsection lower than 175)

Program Requirements:

1. Required Courses (Take ALL):
   - KINE-9698. Community Internship
   - KINE-9920. Independent Study

- KINE-9950. Doctoral Seminar (must register for 6 terms)
- One graduate course chosen in consultation with the thesis advisor

2. KINE-9980. Dissertation Research

3. Students must have graduate-level competency in statistics and/or research design. Depending on graduate level courses taken at the Master's level, students may be asked to complete either KINE-8070 (Quantitative Analysis in Kinesiology) or KINE-8620 (Research Methods), or equivalent.

4. Demonstration of teaching competency. In addition to preparing doctoral candidates as researchers, they will also receive preparation for higher education teaching in the completion of teaching competency units. All doctoral students must accumulate 10 teaching component points over their degree, with no more than half the points being accumulated in one area.

KINESIOLOGY COURSES (KINE-)

All courses listed will not necessarily be offered in any given term.

KINE-8000. Sport Leadership
This course is founded on the notion that leadership is the social application of power, meaning that leadership is not only a structural concept, but that it should be understood through acknowledging the social contexts of an individual, group, or organization. Using current research relating to leadership in a sport context, this course focuses on the current state of sport leadership research, leadership theory, leadership styles, current issues relating to gender and racial representations in leadership positions, and the social construction of leadership.

KINE-8020. Organizational Behaviour in Sport Organizations
This course explores human behaviour in organizational settings, the relationship between human behaviour and group dynamics, and the organization itself. This course focuses on the micro (study of individuals in organizations), meso (study of work groups), and macro-levels (study of how organizations behave) of organizational studies. This course is an in-depth examination of unique areas of organizational behaviour and theory in the field of sport management.

KINE-8030. Sport Marketing
An analysis of research related to the marketing of sport and recreation organizations. Specific emphasis will be placed on the review, critique, and application of both the existing sport marketing literature and current industry practices.

KINE-8040. Advanced Topics in the Psychology of Sport and Exercise
An analysis of the research and literature related to the psychological phenomena influencing the participants in the sport and exercise contexts. Topics include specific sport/exercise intervention techniques, measurement issues and social psychological aspects of sport and exercise.

KINE-8050. Social Issues in Sport Management
To work in the sport industry – whether it be in professional or community sport – one must have an understanding of its consumers and/or participants, including individual factors and macro/systemic influences. It is important for sport organizations to embody equity, diversity, and inclusion (EDI) to ensure all participants feel welcome, included and have equal access to sport. This course takes an intersectionality approach to examining various social identities (e.g., gender, race/indigeneity, LGBTIQ2S+, social class, ability and age) and current issues in the contemporary sport context. Students

will examine how sport is positioned to be both a barrier and a platform for social change and build capacities to make sport more equitable, diverse, and inclusive.

KINE-8060. Crises, Politics and Commercialism in the Modern Olympic Movement
This course focuses on two dimensions: (1) the study of three persistent problems and issues surrounding the history of the Modern Olympic Movement (crises, politics, commercialism), and (2) individual independent research on a course-related topic for which the greater amount of evidence exists in primary documents housed in various regional archives.

KINE-8070. Quantitative Analysis in Kinesiology
The course introduces students to some of the most commonly employed statistical techniques in kinesiology. The content requires a basic background of elementary statistics and mathematical principles. Through classroom discussions, hands-on computer exercises and assignments, students are expected to develop essential understanding of quantitative data analysis techniques and provide interpretations and draw conclusions based on statistical findings drawn from those analyses. (Prerequisite: Kinesiology Master's Student)

KINE-8080. Strategic Management in the Sport Industry
This course integrates and applies academic work studied throughout the graduate Sport Management curriculum. More specifically, it is concerned with the work of the general manager who is responsible for the overall success of the organization. Emphasis will be placed on developing skills for diagnosing and critically analysing complex problems occurring at the organizational level, as well as proposing and implementing realistic solutions to such problems within sport organizations.

KINE-8090. Newsroom
Newsroom situates students into a living, breathing newsroom dedicated to journalistic coverage of University of Windsor Lancer varsity athletics. Students will engage in cross-platform content creation (e.g., text-based, audio, audio/visual journalism) that the job market covets. Student-generated content, in its various forms, will be posted on a course-created website. Alternating "newsroom" roles as the term progresses, learners will experience a number of journalistic duties that will enhance their abilities and understanding of sport media.

KINE-8100. Directed Study
Independent research study and/or directed reading conducted under the advisement of a graduate faculty member. Before enrolling in this course, the student with the help of the supervisor and/or co-supervisor(s) will include a rationale and assessments that ensure learning outcomes are achieved at course conclusion. This course cannot be used as a review of literature for a thesis or internship. Students should expect to commit between 6-9 hours/week in the completion of this course.

KINE-8110 Group Dynamics in Sport and Exercise
This course will examine the psychological and social psychological factors influencing sport behaviours from a group dynamics perspective. Emphasis is placed on understanding the theoretical constructs and empirical research underlying involvement in group dynamics and familiarizing the student with salient measurement issues.

KINE-8210. Clinical Exercise Physiology
This interactive graduate level course is designed to intentionally link theory and practice on topics related to exercise rehabilitation, including exercise prescription and adherence, coronary artery disease and associated risk factors, and other special populations. . Prerequisite: A Vulnerable Sector Check Police Clearance (within the past 1 year) from the town/city/township where you have your permanent address and a negative 2-step Tuberculosis Skin Test (within the past year).

KINE-8220. Bioinstrumentation and Scientific Measurement in Human Research
This course will expose students to bioinstruments, quantitative measurement methods, and signal processing that is used to collect and process human research data. Specifically, this course has been designed for those within the area of human movement science that will measure behaviour/responses of the nervous system, skeletal and smooth muscle, and the cardiopulmonary system. The goal of this course is to: 1) prepare you for conducting research with advanced methodologies and 2) increase your understanding of the methods used in the scientific literature in the areas of biomechanics, neuroscience, ergonomics, exercise physiology, etc.

KINE-8230. Applied Biomechanics of Human Performance
This course will focus on the application of biomechanics concepts in the study of human performance. Specific topics will reflect the interests of students and may include areas such as sports, locomotion, activities of daily living, and equipment testing and design.

KINE-8240. Biomechanics in the Work Place
This seminar-based course will focus on the application of biomechanical principles and tools to occupational activities. Special emphasis will be placed on evaluating foundational and contemporary research supporting and/or refuting the use of specific methods for assessing the physical demands and musculoskeletal injury risk associated with work. Other factors that affect worker health and performance in the workplace will also be discussed.

KINE-8250. Motor Skill Acquisition
This seminar/lecture course will examine the learning processes involved in skill acquisition by novice and experienced learners in a variety of contexts. In lab/field settings students will carry out task analysis and acquire movement observation/analysis skills.

KINE-8260. Motor Control of Human Performance
This seminar/lecture course will examine the perceptual, cognitive, and neurophysiological aspects of human motor control. Different theoretical and methodological approaches will be examined and applied to the understanding of functional movements in the home, workplace, and sporting environment. Changes in the control of movement in special populations will also be examined.

KINE-8270. Advanced Exercise Assessment
Students will evaluate and administer exercise assessments designed for clinical and high-performance settings. In addition, students will learn to interpret data collected from each assessment to accurately prescribe exercise programs. Each laboratory component will be physically demanding in nature. As such, all registered students should be cleared to regularly participate in strenuous activity. Weekly lectures will involve both educational components and roundtable discussions. This course is designed to train students in preparation for challenging the CSEP-CEP exam to become a clinical exercise physiologist. (This is an experiential learning course.)

KINE-8280.Neuromuscular Physiology
This seminar/lecture course will examine fundamental concepts of the neuromuscular system as they relate to movement, exercise and sport. Special emphasis is placed on physiological adaptations of the neuromuscular system as a result of acute (exercise, fatigue, training) and chronic (age, disease) perturbations.

KINE-8290. The Physiology of Sex Differences in Sport, Exercise and Health
The intent of this course is to examine the innate physiological differences that may or may not be responsible for the sex based differences in athletic and exercise performance and health. Specific

attention will be given to the role of endogenous sex hormones, their changes across the lifespan and the physiological systems relevant to exercise that they may or may not modify.

KINE-8300. Skeletal Muscle Pathophysiology
Skeletal muscle not only produces the contractile force required for locomotion, breathing, and communication but is also indispensable for its roles in metabolism and as an endocrine, autocrine and paracrine organ. Skeletal muscle is highly responsive to a spectrum of exercise training modes, but unfortunately, this sensitivity extends to pathological situations. In this course, we will examine the pathophysiology of skeletal muscle in response to disease states such as diabetes, cancer, dystrophy, as well as aging, overtraining, traumatic injury, and disrupted circadian rhythms. The efficacy of exercise intervention to rescue skeletal muscle health will also be examined

KINE-8310. Healthy Aging
This course is designed with the underpinnings of authentic learning and interprofessional learning. The course will help students to develop critical knowledge, understanding, and awareness of concepts related to healthy aging. Students will also have opportunities to critically analyze and assess aspects related to healthy aging in their own (work-) environments. The class will learn to work together sharing experiences and perspectives to contribute to various complex problem-solving case scenarios. Furthermore, the course will be rooted by one of the 4 Grand Challenges promoted by the University of Windsor: Creating Viable, Healthy and Safe Communities. The main healthy aging topics to be discussed in this course will be: fall prevention, health and physical literacy, and age-friendly domains.

KINE-8630. RStudio for Data Science
R, an open-source software for data computing and visualization, is a high in-demand computing language suitable for researchers and modern-day professionals who require support for several statistical analysis techniques, machine learning models, and data analysis and visualizations. Global companies and research institutions have adopted R as the go-to software for data science. In this course you will learn the R language and how to access, use, interpret, and debug some of the 5,000 open-source packages for creating high-quality plots and charts, data wrangling, analyses, and organizing and formatting research data.

KINE-8620. Research Methods
A review and appraisal of qualitative and quantitative research methods with special reference to design, data collection, analysis and generalization.

KINE-8900. External Graduate Course
Must be a course approved by the Faculty of Graduate Studies and Research.

KINE-8940. Selected Topics
Topics developed by individual faculty members, based on new developments in a particular area of study.

KINE-8950. Internship in Kinesiology and Health Studies
A 360-hour practical internship under the supervision of a specialist in a selected organization in the field of Kinesiology and Health Studies. This internship serves as the culminating learning experience, providing an opportunity to apply theoretical and conceptual knowledge gained throughout their coursework in a professional setting. Students will complete a research project designed to strengthen critical thinking, support evidence-informed practice, and enhance the application of research, while also fostering professional development and advancing technical skills and competencies
.

KINE-8970. Thesis

KINE-8980. Internship in Sport Management and Leadership
A 360-hour practical internship under the supervision of a specialist in a selected organization in the field of sport management and leadership. Serving as the culminating learning experience for students pursuing the Master of Sport Management and Leadership (Internship), this experience provides students with an opportunity to apply theoretical and conceptual knowledge gained throughout their coursework in a professional work environment.

KINE-8990. Critical Reflections and Industry Insights in Sport Management and Leadership
A critical analysis and reflection of the internship in sport management and leadership in light of theoretical knowledge gained in program courses and practical experience. Students will engage in reflective practice of their internship experience as a means of critiquing their knowledge and abilities, their career goals, and workplace practices in the sport industry (Prerequisite: KINE-8980.) (Graded on a Pass/Fail basis.)

KINE-9698. Community Internship
A 120-160 hour internship under the supervision of a specialist within a selected community organization (broadly defined). This experience will provide students with an opportunity to apply theoretical and conceptual knowledge gained throughout their coursework (graded pass/fail). (This is an experiential learning course.)

KINE-9920. Independent Study
An independent study conducted under the guidance of a graduate faculty member. The student will engage in research on a discipline relevant issue, using relevant data set(s), leading to the production of a final project. This course cannot be used as a review of literature for dissertation. (Prerequisite: consent of the instructor)

KINE-9950. Doctoral Seminar
Using an inter-disciplinary modular approach, this seminar will provide doctoral students with a background in a variety of frameworks that are relevant to the practice of Kinesiology. Topics presented will reflect students' research backgrounds and interests. Through the seminar, we aim to prepare students to become reflexive members of a scholarly community through focused, intellectual discussion and inquiry. This course will be graded on a PASS/FAIL basis. (Doctoral students must register in this course a total of six semesters during the Fall and Winter terms of full-time registration.)

KINE-9980. Dissertation Research
Students work with a supervisor and committee to develop and implement an original research investigation. The results will be embodied in a professionally organized and written dissertation conforming to the requirements outlined in the Department's PhD. Program Details Manual and by the Faculty of Graduate Studies. The dissertation is expected to be of the highest quality and suitable for publication (graded pass/fail).

FACULTY OF LAW

PROGRAMS

PhD in Argumentation Studies

The program provides expertise in the history, methods, and applications of argumentation scholarship as this interdisciplinary field has developed in the last six decades. Argumentation is defined as collaborative or competitive reasoning through verbal or visual means by which people strive to persuade others on any topic where information, knowledge, or claims conflict or are inconsistent. Different ways for analyzing and evaluating people's arguments address the methods and principles that may be involved, and provide the core subject matter for Argumentation Studies. This will include some attention to policy agendas, interpersonal reasoning, and individual cognition.

Admission Requirements
Students identified for the program will specify which research cluster they wish to work with or detail a project that can be assigned to one of the clusters. This interest should be communicated in a personal statement provided by each student. The members of that cluster will give advice to the program's steering committee of the student's suitability with respect to their background and their intended research. This decision will be based on the statement, their CV and letters of reference. Given the interdisciplinary nature of the program, we would not expect a common background, so decisions will be made on the basis of past performance and letters of reference. Students will also be expected to have achieved a Master's degree (or equivalent professional experience) with an 80% or higher standing. Appropriate Master's programs for admission would include English or Communication Studies (with an emphasis on rhetoric), Rhetoric (with an emphasis on rhetorical theory or debate), Psychology (with an emphasis on reasoning, or bias), Computer Science (with an emphasis on modelling artificial intelligence), Law (with an interest in dimensions of evidence), Political Science (with an emphasis on conflict resolution or political reasoning), Philosophy (with an emphasis on informal logic), Linguistics (with an emphasis on discourse analysis), or Women's Studies (with an emphasis on gender bias and reasoning).

Equivalent professional experience will be assessed in terms of its relevance to Argumentation Studies and presence of background knowledge required for success on the planned project. But all admitted students will have to have shown evidence in their application that they have the requisite requirements for success in the program in terms of both their past education and having experience in a profession (such as law or policy analysis) that uses principles and methods characteristic of our program. The student's Advisory Committee will be drawn from the Research Cluster with which he or she is associated with on admission.

The supervisory committee will determine the number of qualifying graduate courses (if any, to a maximum of three) and students will be informed of these requirements as part of their offer of admission.

Program of Study
Within the first term of the student's registration, his/her Advisory Committee will be formed except for the external examiner, who will be appointed during the final year of a student's study and research (unless the student's Advisory Committee wishes to bring the external in at the proposal stage). The Advisory Committee will be chosen in the manner detailed in Section PhD Program Requirements of the

University of Windsor's Graduate Calendar and consist of the following members as a minimum: an independent examiner external to the university (chosen at the time of the proposal or prior to the final defence), one member from the university faculty but outside of the Argumentation Studies Graduate Program, and three Argumentation Studies Graduate Program members, drawn from the appropriate Research Cluster. The external examiner must be a Full or Associate Professor with expertise in the area being examined and a proven research record. He/she must be impartial to both the student's supervisor and the student. The Dean of the Faculty of Graduate Studies will choose the external examiner on the recommendation of the Argumentation Studies Graduate Program Steering Committee. The external examiner will normally attend the defence and submit a written report on the dissertation to the Dean of Graduate Studies. The final oral defence will be chaired by a designate of the Dean of Graduate Studies.

Degree Requirements
ARGU-9000. History and Theories of Argumentation
ARGU-9010. Advanced Studies in Argumentation
ARGU-9980. Dissertation

Students must successfully complete History of Theories of Argumentation and Advanced Studies in Argumentation. However, in order to progress from fall to winter students must have a 77% average. The courses will be led by the Directors of the program with full faculty involvement on a rotating basis. The courses will be graded in accordance with university standards. All PhD students who have successfully completed the course with a minimum grade of 77% will be expected to attend the courses as auditors in a subsequent year of their program. Requirements to complete the degree are the two multi-disciplinary graduate seminar courses; preparation and defence of a Research Proposal; preparation and defence of an original dissertation.

Oral Qualifying Exam
Students will successfully complete during the first two years of enrolment in the program, an oral qualifying exam, administered by the student's Advisory Committee. Students will be required to possess comprehensive knowledge of their field of study as well as any ancillary fields relevant to the dissertation topic (as determined in advance by the Advisory Committee). It is in terms of ensuring success in this requirement that some students may be directed to take supplementary courses. Students will be evaluated on a satisfactory, unsatisfactory basis. Should a student be unsuccessful in the first attempt at the oral qualifying exam, they will be provided a detailed assessment by their committee and have the opportunity to take a second exam within six months. Students must be judged satisfactory on this background exam before completing their research proposal.

Dissertation
Students must successfully complete and defend a Research Proposal. The dissertation proposal is submitted to and evaluated by the student's Advisory Committee, including the faculty member from another program. Students are evaluated on a pass, fail basis. They will be required to submit a Research Progress Report to the Advisory Committee annually and meet with the committee every six months to discuss progress and research plans.

Following this, students must complete an original research project reported in a dissertation. They must then defend the dissertation in a public lecture before the Advisory Committee, including external members.

Master of Laws (LLM)

Windsor Law's Master's program (LLM) will stress rigorous scholarship, centred on our institutional themes of Access to Justice and Transnational Law. A key feature of the Windsor LLM will be that our students, while enrolled, will make concrete contributions to legal scholarship. Moreover, students in our unique and innovative LLM with Certificate in University Teaching and Learning stream will be offered the chance to complete the University of Windsor's internationally recognized University Teaching Certificate program as part of their course of study, as well as the opportunity to engage in law teaching. In addition to students contemplating an academic career, the program will be suitable for legal practitioners interested in developing expertise in a specialized area of law. Wherever possible, students will be integrated into our Law Faculty's existing Centres, and interdisciplinary and multi-disciplinary collaborations will be promoted.

The experiential learning component of the program consists of the law teaching practicum that students in the LLM with Certificate in University Teaching and Learning stream will complete. The law teaching practicum will, in most cases, extend for a maximum of four weeks (or twelve hours) of teaching. The practicum may be completed in a variety of ways including as part of a team of professors/instructors teaching a course, as a series of guest lectures in a faculty member's course and, for students who show exceptional promise or who have exceptional background in teaching, the teaching of a one-semester course.

Admission Requirements
Students who are accepted to the program will be academically inclined, motivated, and committed to continuous learning. Outside of exceptional circumstances, students applying to the LL.M program will be required to have an undergraduate law degree. In rare cases, a student may be admitted without a law degree. For students without law degrees to gain entry, they must have outstanding grades or experience and superior ability to complete the LL.M program. Admission to the program will be based on four categories which evaluate the student's: a) aptitudes, b) academic achievements, c) research proposal and, d) additional requirements such as reference letters and language proficiency. Details of these four broad categories are as follows:

Aptitudes
Generally, successful students admitted to our LL.M program will demonstrate the following aptitudes in terms of their ability to apply themselves, their knowledge, and their reasoning and communication skills. Specifically, the student accepted into the program will have shown evidence of:

Application: exceptional academic motivation; capacity for sustained and intense work; developed ability to organize time and set own agenda for study; academic curiosity for investigation and learning.

Knowledge: a broad, deep, advanced, and integrated understanding of the main branches of law and / or a related discipline.

Reasoning ability: outstanding analytical abilities, including the ability to draw and maintain fine distinctions, the ability to separate the relevant from the irrelevant, and the ability to develop and sustain complex arguments; capacities for accurate observation and insightful criticism, including willingness and ability to engage with disciplines other than law and to bring their insights to bear on legal problems; originality and creativity of thought, open-mindedness, and capacity for lateral thinking; excellent powers of synthesis.

Communication: willingness and ability to express highly complex ideas clearly and effectively; ability to conduct a mature debate leaving room for the contributions of others; aspiration to professional standards of style and organization in legal and scholarly writing.

Academic Achievements
First and foremost, applicants will be able to demonstrate their exceptional abilities through their academic achievements. Generally, this will mean high academic standing – normally at least a 70% average in an undergraduate law program (although this alone will not necessarily guarantee admission), and evidence of interest in academic pursuits (for example, pursuing independent/supervised research studies, publications, editing of academic work, etc.). For applicants applying from the workforce, noteworthy achievements may also be taken into account for what they reveal about the applicant's ability to succeed academically within a Master's program in Law. All applicants will also be required to submit their undergraduate transcripts.

Research Proposal
A significant element of each student's application package will be the statement of proposed research. The research proposal should provide evidence of the candidate's ability and potential to engage with the relevant scholarly literature, doctrinal and/or empirical material and to formulate pertinent research questions. An academic writing sample will also be required.

Additional Requirements
Applicants will be asked to submit at least two letters of reference that show support for their scholarly endeavour. Admission will be contingent upon availability of a suitable supervisor and suitable reference materials for the applicant to pursue their research project.

Finally, all students must meet an English language proficiency standard of 250 (600) IBT-100 minimum on the TOEFL or 7.0 IELTS

Degree Requirements

One Year Stream (LLM)

Total courses:
(a) Research Methods (6 credits)
(b) Graduate Seminar (1 credit)
(c) Legal Theory (3 credits)
(d) Thesis (12 credits)
(e) 0-2, 3-credit courses, depending on student's background

Two Year Teaching Stream (LLM)

Total courses:
(a) LAWM-8100. Research Methods (6 credits)
(b) LAWM-8300. Graduate Seminar (1 credit)
(c) LAWM-8200. Legal Theory (3 credits)
(d) LAWM-8970. Thesis (12 credits)
(e) 0-2, 3-credit courses, depending on student's background
(f) Complete and obtain the Centre for Teaching and Learning (CTL)University Teaching Certificate
(g) LAWM-8400. Law Teaching in the Diverse Classroom (1.5 credits)
(h) Students in this stream must also complete the Law Teaching Practicum (non-credit)

Additional requirements:
Presentation of research at scholarly conferences or other academic venues outside of Windsor Law's graduate program.

In order to obtain wider academic feedback, students will be required to present their research as an academic talk. During the write-up phase of their thesis, students will be a) required to present their work in progress in an open faculty/graduate student seminar (outside of the graduate seminar) and b) encouraged to present their work at subject-relevant conferences which foster graduate student networking, such as the Canadian Law and Society Association annual conference.

Subject-relevant conferences should be academic in nature for example, a graduate students' conference, faculty seminars, or conferences/workshops set up by learned associations such as the Canadian Law and Society Association. Students may also organize their own talks. In this connection, the Graduate Studies Committee has begun to make connections with other universities and research institutes which may be interested in hosting presentations by our graduate students.

Standing Required for Continuation in the Experiential Learning Option of the Program
Students will need to pass the teaching practicum and otherwise meet the normal regulations for continuation in the program as set by the University's regulations.

LAW COURSES (LAWM-)

MASTER OF LAW (LAWM-)

LAWM-8100. Research Methods
Through this required course, and in view of writing the LLM thesis, students will focus on developing research questions, elaborating appropriate methodological approaches for their graduate research (i.e. the Master's thesis), preparing a research agenda, creating a literature review, and on creating a written report of their research findings. The central part of the course will place emphasis on learning contemporary methodological approaches to legal scholarship. Although the research methods discussed may vary from year to year, doctrinal (case-based), qualitative, and historical research methods will be examined. Students will also develop ethical and interdisciplinary approaches to academic legal research and advanced library research skills. (6 credits, 2-term course.) (Open only to LLM students.)

LAWM-8200. Legal Theory
Drawing from continental and analytic writings manifesting social contextual, historical, anthropological, and philosophical perspectives, this course will, in particular, examine issues surrounding the relation of legal orders to outsiders, the social-cultural context of the nature of a law, the nature of legal obligation and the boundary of law as a discourse.

LAWM-8300. Graduate Seminar
An adjunct to the LL.M Research Methods course, the Graduate Seminar will provide a forum in which students can discuss their ongoing research and present portions of their work for feedback from the course director and their peers. The seminar will convene for the equivalent of 1hour/week, every other week, over the course of the fall and winter semesters (12 hours total).

LAWM-8400. Law Teaching in the Diverse Classroom
This course will examine theory and techniques for engaging with controversial topics in the law school class setting. Through this course, students will focus on learning, and evaluating critically, different approaches to teaching in classroom settings that require cultural competence and other diversity

competencies. This course will focus on understanding how student learning is influenced by individual experiences, gender, language, culture, family and community. Students will also work on developing their own approaches to teaching in such settings. This course serves to complement the LL.M student's learning experience in the University Teaching Certificate Program (or equivalent) by offering exposure to issues related specifically to law teaching. (Prerequisite for students in the teaching stream: completion lesson plan exercise in the course CTLP-8100 Learning-Centred Teaching in Higher Education) (1.5 credit)

LAWM-8970. Thesis
The central component of the program's requirements is the completion of original publishable research. A major written piece of original research, the thesis may be submitted as one single document or as a set of publishable articles totalling approximately 100-125 pages in length.

MASTER OF SOCIAL WORK/JURIS DOCTOR (LAWG-)

LAWG-5916. Mental Health Justice Clinic
This course is an opportunity for students to reflect on the violence that legal systems inflict on consumers/survivors of the psychiatric system. It offers students both substantive knowledge (in a weekly seminar) and practical experience (as a regular in-person placement in a community service setting). Students will attend in-class seminars where they will investigate the relevant laws and issues impacting individuals with mental health disabilities. Students will also attend regular in-person clinic dates during the semester. The clinic will be held at a community organization where mental health supports/services are also delivered. Health Justice Partnerships integrates lawyers and law students into health settings and are critical examples of cross-sector collaboration that addresses social problems that no one sector can solve on its own. Students work in support of the movement of disabled and "Mad" people by providing summary advice, public education and outreach under the supervision of counsel. (Prerequisite and/or Co-requisite: LAWG-5849. Mental Health and the Law) (This is an experiential learning course)

LAWG-5930. Law and Social Work: Advanced Practice Research Methods and Policy Analysis
This course prepares students to use the practitioner-researcher model in the analysis of social policy, as it relates to law, in Canada. This model includes problem formation, qualitative and quantitative research design, data analysis and interpretation, and the dissemination of findings. Students will learn to apply specific analytic frameworks and theories, drawn from law and social work, to issues of Canadian social policy. In addition, students will learn essential elements of program evaluation including needs assessment, program logic models, implementation and process evaluations, and impact evaluations. Particular attention will be given to the implications of social policy for vulnerable and oppressed populations. Credit Weight 4.0. (Cross-listed with SWRK-8625).

LAWG-5931. Advanced Seminar in the Theory and Practice of Social Work and the Law
This seminar focuses on the intersection of law and social work in theory and practice. It will prepare students to think critically about the interrelationship between law and social work, both as disciplines and professions, and to identify and analyze theoretical and substantive areas of compatibility and tension. The challenges of interdisciplinary practice will be considered, with a particular emphasis on ethical norms and the advancement of social justice. (Open to MSW/JD students only, or with the permission of both program areas.) (Credit Weight 4.0.) (Cross listed with SWRK-8626).

ARGUMENTATION COURSES (ARGU-)

ARGU-9000. History and Theories of Argumentation
This course, offered in the Fall term each year, explores the major movements in argumentation theory, beginning with the Ancient Greeks and proceeding through the twentieth century, and part introduction to

further research agendas in the field. The course involves in-depth readings and discussions of seminal texts in the field, including such figures as Aristotle, Toulmin, Perelman, Hamblin, Walton, and van Eemeren. There is intensive reading involved, and students will be expected to demonstrate (through discussion and papers) a thorough understanding of this core material. (6.0 credit)

ARGU-9010. Advanced Studies in Argumentation
This course, offered in the Winter term each year, will introduce students to different fields of current research in argumentation studies as conducted by members of the faculty. Themes may include 'Feminism and Argumentation', 'Argumentation in Cognitive Science and Artificial Intelligence', 'Advances in Multi-modal Argumentation,' among others. Reading lists will depend on the topics involved each year. (Prerequisite: 14-ARGU-9000 History and Theories of Argumentation) (6.0 credit)

ARGU-9980. Dissertation Research
Students work with a supervisor and committee to develop and implement an original research investigation, informed by the training in Argumentation Studies provided by the coursework and Qualifying Examination. The results will be embodied in a professionally organized and written dissertation conforming to the requirements outlined in the Graduate Calendar for the Argumentation Studies program and by the Faculty of Graduate Studies. The dissertation is expected to be of the highest quality and suitable for publication (Graded pass/fail). (Prerequisites: ARGU-9000 and ARGU-9010; passing Qualifying Exam.)

FACULTY OF NURSING

NURSING PROGRAM REGULATIONS

Academic Regulations (All MSCN Program Streams and Nurse Practitioner (NP) Diploma)

1. The minimum grade required in all graduate courses is 70%. Any student who does not successfully complete a course may repeat it once at the discretion of the Dean of the Faculty of Nursing and the Dean of the Faculty of Graduate Studies. The student may not repeat more than one course.
2. For continuation in and graduation from all MScN programs and the Nurse Practitioner (NP) Graduate Diploma, the Faculty of Graduate Studies requires that students maintain at least a 70% cumulative average. A minimum grade of 70% is required in each course. A student who does not obtain credit in any course may repeat the course once only.
3. For students in the NP stream, there may be no more than a 3-year lapse between NP courses in the Nurse Practitioner Stream. The maximum time limit for part-time is 5 years; 3 years for full-time.
4. All candidates' programs are subject to approval by the Associate Dean of Graduate Programs, Nursing.
5. Students of the Faculty of Nursing are required to demonstrate behaviours consistent with the " with all College of Nurses of Ontario (CNO) practice standards and guidelines. A complete list of the current CNO practice standards and guidelines is available at https://www.cno.org/en/learn-about-standards-guidelines/standards-and-guidelines/. Examples of CNO practice standards/guidelines/resources for which demonstrated behaviours are expected include:
   - Code of Conduct
   - Therapeutic Nurse-Client Relationship
   - Professional Misconduct
   - Social Media: Reflect Before You Post
   - Social Media Use: Common Expectations for Nurses

Failure of any Nursing student to conform to the principles of these documents may result in dismissal from any of the Faculty of Nursing's graduate programs

English Language Proficiency Admission Requirements for International Applicants (All Nursing Programs)

International applicants are required to demonstrate English language proficiency at a level consistent with the minimum benchmark scores established by the College of Nurses of Ontario (CNO) for nurse registration in Ontario. Applicants must achieve the current CNO minimum benchmark scores for all components in one complete attempt of an approved English language proficiency test. Accepted tests include those recognized by the CNO for registration purposes (e.g., IELTS, OET, PTE Academic). Current CNO benchmark scores for each accepted test are available at https://www.cno.org/become-a-nurse/registration-requirements/proficiency-in-english-or-french/accepted-language-proficiency-tests.

The Test of English as a Foreign Language Internet-Based Test (TOEFL iBT) is also accepted as an alternative, provided the applicant achieves scores that are consistent with the current CNO IELTS benchmarks, based on the official score comparison table published by IELTS at https://ielts.org/organisations/ielts-for-organisations/compare-ielts. Applicants must arrange to send the appropriate language proficiency test scores directly to the University of Windsor.

Test results must have been issued within two years prior to the date of application. Meeting the language proficiency requirement at admission does not exempt students from demonstrating continued English language proficiency throughout the program, as required for clinical placements and program progression

PROGRAMS

PhD in Nursing

The PhD program, focusing on health outcomes and health services research, will involve four years of full-time study. It will combine coursework, comprehensive exams and a dissertation. This program will prepare graduates to assume leadership roles in academic and practice settings. Research and scholarly activities will prepare graduates to contribute to nursing practice, the design and delivery of health care, and policy development.

Admission Requirements
Applicants must:
1. Have a completed baccalaureate degree in nursing from a recognized university.
2. Have a completed Master's degree in nursing or other relevant discipline from a recognized university .
3. Applicants must have current registration in a Canadian jurisdiction with no practice restrictions. Must be registered with the College of Nurses of Ontario prior to registration for thesis credits.
4. Have a minimum 77% (B+) average in their Master's program.

Applicants must submit the following documents:
1. Curriculum vitae (CV)
2. Three professional letters of reference.
3. Provide two examples of independent scholarly work (e.g., publications, research reports, course assignments)
5. For international students, successful completion of an English Language Proficiency Exam may be required.

An interview may be required.

Degree Requirements
NURS-9100. Philosophy of Science in Nursing
NURS-9200. Advanced Perspectives in Quantitative Research Methods and Analysis
NURS-9300. Advanced Perspectives in Qualitative Research
One graduate level course
NURS-9410. Comprehensive Exam
NURS-9980. Dissertation

In addition to the degree requirements, all students in the PhD Program must complete a series of professional development activities prior to enrolling in NURS-9410. Comprehensive Examinations.

Master of Science in Nursing (MScN)

Candidates for the MScN Master of Science in Nursing degree will pursue studies in one of three streams:
1. Course-based Stream
2. Thesis Stream
3. Nurse Practitioner Stream

Admission Requirements for the Course-Based and Thesis Streams
1. All general regulations of the Faculty of Graduate Studies and Research admission requirements are applicable.
2. Applicants must have a Bachelor of Science in Nursing or equivalent which includes physical assessment, and courses in research and statistics. Consideration may be given to nurse applicants holding degrees in other cognate disciplines.
3. Applicants must have maintained an overall 70% average in their undergraduate nursing program.
4. Applicants must have current registration with the College of Nurses of Ontario with no practice restrictions.
5. Three Faculty of Nursing confidential reports must be completed by academic/professional referees, with at least one from an academic who has taught the applicant and one from a recent employment supervisor. Applicants who are unable to obtain an academic reference must provide sufficient rationale for not being able to obtain a reference; otherwise, their application will not be considered.
6. An "Applicant Profile" must be completed which includes a section addressing goals in seeking graduate education (narrative statement).
7. Applications for admission must be completed and submitted by February 1.

An interview may be required.

Admission Requirements for the Nurse Practitioner (NP) Stream
1. All general regulations of the Faculty of Graduate Studies and Research admission requirements are applicable.
2. Applicants must have a Bachelor of Science in Nursing or equivalent which includes physical assessment, in research and statistics. Consideration may be given to Registered Nurses (RN) applicants holding degrees in other cognate disciplines.
3. Applicants must have maintained an overall 70% average in their undergraduate nursing program.
4. Applicants must have current registration as a Registered Nurse with the College of Nurses of Ontario with no practice restrictions.
5. Three Faculty of Nursing confidential reports must be completed by academic/professional referees, with at least one from an academic who has taught the applicant and one from a recent employment supervisor.
6. Completion of an “Applicant Profile” and a “Nurse Practitioner Personal Essay”, which include sections addressing qualifications and rationale for seeking graduate education and as an MScN Nurse Practitioner Stream.
7. Applications for admission must be completed and submitted by February 1.
8. Applicants must have 3640 hours practicing as a registered nurse with direct patient care working in a clinical setting. Employer-submitted proof of hours is required from all nursing employers. All hours are considered; however, clinical experience within the past five years is required.

An interview may be required.

Note: This is a limited enrolment program. Therefore, possession of the minimum published requirements does not guarantee admission. Preference will be given to Ontario residents whose work experience in nursing has been continuous and who have clinical experience in various clinical settings with patients across the lifespan.

Degree Requirements

Course-Based Stream:
Students admitted to the course-based stream must successfully complete seven foundational courses, plus two Nursing courses at the 8000-level, and the Integrated Practicum in Nursing Scholarship. Specifically, the requirements for an MScN (course-based stream) may be satisfied by pursuing a full-time or part-time program of studies consisting of:

NURS-8400. The Scholarship of Nursing Knowledge and Practice
NURS-8410. Evidence Utilization
NURS-8420. Health Research Methods
NURS-8430. Leadership Innovations in Advanced Nursing Practice
NURS-8440. Improvement Science
NURS-8450. Promoting Health Equity Among Diverse Groups
NURS-8460. Teaching and Learning: Theory and Practice
Two graduate level courses (NURS-8XXX or another faculty)
NURS-8470. Integrated Practicum in Nursing Scholarship

Suggested Full-Time Course-based Course Sequence

YEAR I
Fall Semester
NURS-8400. The Scholarship of Nursing Knowledge and Practice
NURS-8410. Evidence Utilization

Winter Semester
NURS-8420. Health Research Methods
NURS-8430. Leadership Innovations in Advanced Nursing Practice

Summer Semester
NURS-8440. Improvement Science
NURS-8450. Promoting Health Equity Among Diverse Groups

YEAR II
Fall Semester
NURS-8460. Teaching and Learning: Theory and Practice
Graduate level course (NURS-8XXX or another faculty)

Winter Semester
NURS-8470. Integrated Practicum in Nursing Scholarship
Graduate level course (NURS-8XXX or another faculty)

Thesis-Based Stream:
Students admitted to the thesis-based stream must successfully complete six foundational courses and 4 semesters of Thesis credit (NURS-8970 Thesis). The thesis stream must be completed as a full-time student.

Specifically, the MScN (Thesis stream) may be satisfied by pursuing a full-time program of studies consisting of:
NURS-8400. The Scholarship of Nursing Knowledge and Practice
NURS-8410. Evidence Utilization

NURS-8420. Health Research Methods
NURS-8430. Leadership Innovations in Advanced Nursing Practice
NURS-8450. Promoting Health Equity Among Diverse Groups
NURS-8460. Teaching and Learning: Theory and Practice
NURS-8970. Thesis (4 semesters)

Additional information concerning the procedure for theses may be obtained from the Associate Dean, Graduate Programs, Nursing.

The master's thesis committee is chosen in the manner described in the section titled, 'The Master's Degree Program Requirements' of this Graduate Calendar. The final examination will be conducted by the student's master's committee.

Suggested Full-Time Thesis-based Course Sequence

YEAR I
Fall Semester
NURS-8400. The Scholarship of Nursing Knowledge and Practice
NURS-8410. Evidence Utilization

Winter Semester
NURS-8420. Health Research Methods
NURS-8430. Leadership Innovations in Advanced Nursing Practice

Summer Semester
NURS-8450. Promoting Health Equity Among Diverse Groups
NURS-8970. Thesis

YEAR II
Fall Semester
NURS-8460. Teaching and Learning: Theory and Practice
NURS-8970. Thesis

Winter Semester
NURS-8970. Thesis

Summer Semester
NURS-8970. Thesis

Nurse Practitioner (NP) Stream:
This is a 24-month program designed for Registered Nursing who completed a baccalaureate nursing program. Students admitted to the NP stream must successfully complete three core courses in addition to those required by the Ontario Nurse Practitioner Educational Consortium and seven NP courses. Information about the ONPEC is available at https://onpec.ca

The requirements for the MScN (NP) stream may be satisfied by pursuing full-time study, consisting of the following courses:

Core courses:
NURS-8400. Scholarship of Nursing Knowledge and Practice
NURS-8410. Evidence Utilization

NURS-8440. Improvement Science

Nurse Practitioner courses:
NURS-8500. Pathophysiology for Nurse Practitioners
NURS-8520. Roles and Responsibilities
NURS-8570. Advanced Health Assessment and Diagnosis I
NURS-8580. Advanced Health Assessment and Diagnosis II
NURS-8610. Therapeutics I
NURS-8620. Therapeutics II
NURS-8870. Integrative Practicum

Suggested Full-Time Nurse Practitioner Stream

YEAR I
Fall
NURS-8400. The Scholarship of Nursing Knowledge and Practice
NURS-8500. Pathophysiology for the Nurse Practitioner (3 credit hours, 2 terms)

Winter
NURS-8410. Evidence Utilization
NURS-8500. Pathophysiology for the Nurse Practitioner (3 credit hours, 2 terms)

Summer
NURS-8440. Improvement Science

YEAR II
Fall
NURS-8570. Advanced Health Assessment and Diagnosis I (4.5 credit hours)
NURS-8520. Roles and Responsibilities (3 credit hours, 2 terms)
NURS-8610. Therapeutics I (4.5 credit hours)

Winter
NURS-8580. Advanced Health Assessment and Diagnosis II (4.5 credit hours)
NURS-8520. Roles and Responsibilities (3 credit hours, 2 terms)
NURS-8620. Therapeutics II (4.5 credit hours)

Summer
NURS-8870. Integrative Practicum (12 credit hours)

Nurse Practitioner Graduate Diploma (Post-Masters) Program

This is a twelve-month program designed for Registered Nurses who already have a master's degree in nursing. Applications are made through the Ontario Universities' Application Centre (OUAC). The program is delivered through the Ontario Nurse Practitioner Education Consortium (ONPEC). Information about the ONPEC is available at https://onpec.ca.

Admission Requirements
1. All general regulations of the Faculty of Graduate Studies and Research admission requirements are applicable.
2. Applicants must have a master’s degree in Nursing.
3. Applicants must have maintained an overall B average in their undergraduate nursing program.

4. Applicants must have maintained an overall 70% average in their undergraduate nursing program.
5 Applicants must have current registration with the College of Nurses of Ontario with no practice restrictions.
5. Three Faculty of Nursing confidential reports must be completed by academic/professional referees, with at least one from an academic who has taught the applicant and one from a recent employment supervisor.
6. Completion of an "Applicant Profile" and a "Nurse Practitioner Personal Essay", which include sections addressing qualifications and rationale for seeking graduate education in the NP Stream.
7. Applications for admission must be completed and submitted by February 1.
8. Applicants must have 3640 hours practicing as a registered nurse with direct patient care working in a clinical setting. Employer-submitted proof of hours is required from all nursing employers. All hours are considered; however, clinical experience within the past five years is required.

An interview may be required.

Note: This is a limited enrolment program. Therefore, possession of minimum published requirements does not guarantee admission. Preference will be given to Ontario residents whose work experience in nursing has been continuous and who have clinical experience in various clinical settings with patients across the lifespan.

Degree Requirements

The requirements for the NP Graduate Diploma Certificate stream may be satisfied by pursuing full-time study in the following courses:

Fall

NURS-8500. Pathophysiology for the Nurse Practitioner (3 credit hours, 2 terms)
NURS-8520. Roles and Responsibilities of the Nurse Practitioner in Primary Health Care. (3 credit hours, 2 terms)
NURS-8570. Advanced Health Assessment and Diagnosis I (4.5 credit hours)
NURS-8610. Therapeutics I (4.5 credit hours)

Winter

NURS-8500. Pathophysiology for the Nurse Practitioner (cont'd, 3 credit hours, 2 terms)
NURS-8520. Roles of the Nurse Practitioner in Primary Health Care (cont'd, 3 credit hours, 2 terms)
NURS-8580. Advanced Health Assessment and Diagnosis II (4.5 credit hours)
NURS-8620. Therapeutics II (4.5 credit hours)

Summer

NURS-8870. Integrative Practicum (12 credit hours)

NURSING COURSES (NURS-)

Not all of the courses listed below will necessarily be offered in any one year.

NURS-8300. Advanced Health Assessment, Diagnostics, and Therapeutics of the Oncology/Palliative Patient I
This course prepares students with advanced skills in health assessment, diagnostics and therapeutics in preparation to provide holistic care to individuals who have experienced alterations in their physical health from cancer treatment and/or may also to individuals who are palliative. Students will learn through lectures, readings, and simulation in the laboratory, learn and practice performing a holistic health history and the techniques of inspection, percussion, palpation and auscultation for systematic health assessment of individuals

NURS-8310. Leadership and Management in Oncology/Palliative Care Settings
This course prepares students who work across the continuum of cancer care for advanced practice and leadership roles. Course content will focus on the examination and critical appraisal of concepts and theories of leadership, research, management, and education within the context of oncology and palliative nursing environments. Emphasis will be placed on organizational and change theories, professional practice, decision-making and governance models, power and social justice concepts. Strategies for knowledge transmission and information system development will be appraised. Note: This course is equivalent to NURS-8880; thus, students who take NURS-8880 will not be eligible to take this course for credit.

NURS-8320. Advanced Health Assessment, Diagnostics, and Therapeutics of the Oncology/Palliative
Patient II
This course is the second of two advanced health assessment, diagnostics and therapeutics courses of the Oncology/Palliative diploma that are designed to prepare students with advanced skills to provide holistic care to individuals who have experienced alterations in their physical health from cancer treatment and/or may also be in need of palliative care. Students will learn through lectures, readings, and simulations, learn and practice performing a holistic health history along with advanced techniques in inspection, percussion, palpation and auscultation for systematic health assessment of individuals.

NURS-8330. Interprofessional Psychosocial Oncology: Introduction to Theory and Practice
This course is required for the graduate diploma in Advanced Practice Oncology/Palliative Care. It is also open to other students from any discipline enrolled in Masters of PhD program to take as an unspecified graduate course. It provides graduate students with an introduction to the field of psychosocial oncology. Emphasis is placed on understanding and interpreting the experience of cancer informed by theory, evidence and illness narratives. This course also emphasises an understanding of the illness experience and assists the student to assess distress and coping from a family centred perspective. This course draws on a case-based, narrative format and provides opportunities to learn in small groups of interprofessional learners drawn from across Canada.

NURS-8340. Advanced End of Life Care
This course teaches the specialized assessment, diagnostics and therapeutics needed to care for patients at the end of life. This class will focus on, but is not limited to, disease management; psychological and physical support: loss, grief, social, and practical end of life care management along with spiritual support for caregivers and the patient. Students will learn through lectures, readings, case studies and assignments how to more effectively care for these patients and their family members. They will learn the basics of the theories used in palliative care and the fundamentals of how to care for a dying patient and their family members.

NURS-8350. Oncology/Palliative Capstone Project
This course will provide learners with the opportunity to synthesize concepts from prior coursework and to undertake an in-depth exploration of an area of oncology/ palliative care nursing practice. Students will systematically search, analyze, and synthesize relevant research literature and make recommendations for practice, education and research. The student will write an evidence-based scholarly article that is suitable for publication in a journal. (Prerequisites: NURS-8300, NURS-8310, NURS-8320, NURS-8330, NURS-8340)

NURS-8360. Relational Practices with Families in Oncology and Palliative Care
This is the second psychosocial oncology course offered through the Canadian Association of Psychosocial Oncology (CAPO) Interprofessional Psychosocial Oncology Distance Education (IPODE) project. It provides graduate students in health care disciplines (e.g., medicine, nursing, psychology, social work, and spiritual care) with an opportunity to explore the interprofessional care of families experiencing cancer along the illness trajectory from diagnosis through to bereavement or long-term survivorship.

NURS-8370. Sexual Health and Counselling in Cancer
This is the third psychosocial oncology course offered through the Canadian Association of Psychosocial Oncology (CAPO) Interprofessional Psychosocial Oncology Distance Education (IPODE) project. It provides graduate students in health care disciplines (e.g., medicine, nursing, psychology, social work, and spiritual care) with an opportunity to explore the interprofessional care, knowledge, and skills to intervene with the sexual issues that arise in cancer patients from a psycho-educational perspective.

NURS-8400. The Scholarship of Nursing Knowledge and Practice
In this course, the learner will critically explore the attributes and value of nursing scholarship in advancing the discipline of nursing and the practice of nurses working in both direct and indirect nursing roles. The learner will explore the theoretical evolution of the discipline of nursing and engage in interpreting the scholarship of discovery, integration, teaching, as well as other ways of knowing, to inform nursing research and practice. An emphasis is on competencies of knowledge, critical inquiry, direct and indirect practice, professionalism, communication, and collaboration. The evaluation of selected nursing conceptual models/theories is emphasized. (Credit may not be obtained for both NURS-8810 and NURS-8400.)

NURS-8410. Evidence Utilization
In this course, the learner will advance scholarship in using health evidence in practice. The focus of the course is on locating, appraising, integrating, and mobilizing evidence for the purpose of promoting person, family, community and population health and/or optimizing health systems. Learning activities will engage the learner in questioning the meaning and usefulness of evidence, as well as advancing competency in effectively communicating and implementing the evidence to/among various stakeholders. (Credit cannot be obtained for both NURS-8410 and NURS-8820.)

NURS-8420 Health Research Methods
In this course, the learner will examine diverse approaches for generating knowledge with an emphasis on the scholarship of discovery. The learner will apply competencies in knowledge, research and critical inquiry, and communication and collaboration to answer research questions that employ selected paradigms/traditions (quantitative, qualitative, mixed methods) and that are informed by theory and the literature. An emphasis is on research design and data analysis. The learner will develop a research proposal for generating meaningful knowledge that improves the health of patients/clients, groups, communities, populations, nursing practice, and/or health systems. (Credit cannot be obtained for both NURS-8420 and NURS-8830).

NURS-8430. Leadership Innovations in Advanced Nursing Practice
This course will provide the learner with the opportunity to critically explore concepts related to leadership in healthcare including power, social justice, health equity, and organizational dynamics. The learner will examine their role in knowledge translation and mobilization, the complexity of ethics of health care, professional practice, and the development and implications of health policy. Opportunities will be provided to examine patient safety, human resource management, nursing and continuing education, organizational finance, and evidence-informed practice. Learners will evaluate models of leadership to facilitate goal attainment for diverse populations, promote accountability within self and team members, and enable improvements within the health care system.

NURS-8440. Improvement Science
In this course, the learner will explore the core principles of improvement science and its application in the design and delivery of safe, effective, efficient, timely, person/family centred, sustainable, and equitable health care. The learner will engage in the scholarship of discovery, integration, and application and apply competencies of knowledge, leadership, communication and collaboration, and health system optimization. The focus of the course is on using data and research evidence to drive meaningful change through the application of a variety of quality improvement methods and tools. Learners will advance their skills in identifying areas for improvement, tracking and measuring progress, and implementing changes that can improve nursing practice, optimize the healthcare system and lead to better outcomes.

NURS-8450. Promoting Health Equity Among Diverse Groups
This course will enable the learner to explore the intersections of the social determinants of health, power, and privilege, and other factors on the health and health outcomes of diverse groups, including but not limited to Indigenous Peoples in Canada, racialized groups, 2SLGBTQIA+ folks, people experiencing homelessness/housing insecurity, and people living in rural/remote geographies. Learners will engage in the scholarship of integration and application of evidence-based knowledge, public health and population health frameworks, and other ways of knowing to promote health equity among equity groups at the person, family, community, and population health levels. Competencies of research and critical inquiry, communication, collaboration, and leadership will be applied in course learning activities and within the shared learning space.

NURS-8460. Teaching and Learning: Theory and Practice
In this course, the learner will critically explore concepts related to the scholarship of teaching. The focus is on developing competency in teaching and learning among nurses working in advanced indirect practice roles, with an emphasis on those working in academic settings. The learner will analyze various issues and forces (theoretical, philosophical, historical, socio-cultural, political, economic, and professional) that shape teaching and learning in nursing education in Canada. Learning activities will engage the learner in discovering and applying innovative teaching-learning strategies, designing curriculum and educational materials, and in the assessment and evaluation of learning.

NURS-8470. Integrated Practicum in Nursing Scholarship
In this course, the learner will undertake a project that will engage them in the scholarship of discovery, integration, teaching, and application within the context of indirect nursing practice. The learner will apply a range of competencies to address a gap or issue within the selected setting, with an emphasis on knowledge, research and critical inquiry, leadership, teaching/learning, communication and collaboration, person, family, community and population health, and health system optimization. Projects may be focused on teaching/learning or a complex system-related issue at the unit and/or organizational level. The learner will negotiate the project setting. Pre-requisites or co-requisite: All core courses in the MScN (course based). (Credit cannot be obtained for both NURS-8470 and NURS-8910).

NURS-8500. Pathophysiology for Nurse Practitioners
Examine theoretical and practice related concepts in pathophysiology as a basis for advanced nursing practice. Explore alterations in physiological function with an emphasis on age-related, acute, episodic, and chronic conditions found in primary health care practice. (3 hours per week.) (3 credit hours, 2 terms)

NURS-8520. Primary Health Care Nurse Practitioner Roles and Responsibilities
Compare and contrast advanced practice nursing and related frameworks to develop, integrate, sustain, and evaluate the role of the nurse practitioner within primary health care. Critically analyze and develop strategies to implement advanced practice nursing competencies (research, leadership, collaboration, and health and social policy). (Prerequisites or Co-requisites: NURS-8810 and NURS-8830.) (3 hours per week.) (3 credit hours, 2 terms)

NURS-8540.Evidence-Based Practice (EBP) for Advanced Practice Nursing (APN)
This course provides students with the knowledge and skills required to identify and use best evidence in advanced practice roles. The course focuses on developing a relevant evidence-based practice question, and searching appropriate evidence resources. Frameworks for the critical appraisal of quantitative and qualitative studies will be critiqued. Issues related to influencing practice and health outcomes through evidence, at the level of the individual practitioner and the health care organization, are addressed. This course will explore paradigms and theories that inform knowledge development and knowledge transfer. The foci of the course are the exploration, critical analysis, and application of concepts. Challenges and strategies related to addressing complex health care system issues through evidence, at the level of the individual practitioner and the health care organization, are addressed. (Prerequisites: NURS-8810 and NURS-8830.)

NURS-8560. Research Utilization Project: Evidence Based Decision Making in Health Care: Integrating Knowledge into Advanced Practice
This course provides students with the knowledge and skills required to identify and use best evidence in advanced practice roles. The course focuses on developing a relevant evidence-based practice question, and searching appropriate evidence resources. Frameworks for the critical appraisal of quantitative and qualitative studies will be critiqued. Learning is facilitated through seminars, and workshops to address a question emerging from their own practice. Issues related to influencing practice, and health outcomes through evidence, at the level of the individual practitioner and the health care organization are addressed. (Prerequisite: Enrolled in Ontario Nurse Practitioner Education Consortium (ONPEC) program)

NURS-8570. Advanced Health Assessment and Diagnosis I
Differentiate concepts and frameworks essential to advanced health assessment, clinical reasoning, and diagnosis in advanced nursing practice. Apply clinical, theoretical, and scientific knowledge in comprehensive and focused health assessment, including history taking, physical examination, diagnostic reasoning, and interpretation for the individual client's diagnostic plan of care. (Prerequisites or co-requisites: NURS-8500 and NURS-8810.) (3 hours seminar per week; 6 hours clinical per week.) (4.5 credit hours)

NURS-8580. Advanced Health Assessment and Diagnosis II
Integrate conceptual frameworks integral to advanced health assessment, clinical reasoning, and diagnosis in advanced nursing practice. Demonstrate substantive initiative, responsibility, and accountability in complex decision making for individual clients, groups, and/or communities within the nurse practitioner scope of practice. (Prerequisites or co-requisites: NURS-8570 and NURS-8810.) (3 hours seminar per week; 6 hours clinical per week.) (4.5 credit hours)

NURS-8610.Therapeutics I

Critically appraise and interpret concepts and frameworks integral to pharmacotherapy, advanced counseling, and complementary therapies for common conditions across the lifespan. Develop, initiate, manage, and evaluate therapeutic plans of care that incorporate client values and acceptability, goals of therapy, analysis of different approaches, pharmacotherapeutic principles. (Prerequisites or co-requisites: NURS-8570, NURS-8810 and NURS-8830.) (3 hours seminar per week; 6 hours clinical per week.) (4.5 credit hours)

NURS-8620.Therapeutics II
Integrate conceptual frameworks and evidence underlying the study of pharmacotherapy, advanced counseling, and complementary therapies for complex client situations. Demonstrate substantive initiative, responsibility, and accountability in complex decision making. (Prerequisites or co-requisites: NURS-8580, NURS-8610, NURS-8810, NURS-8820 and NURS-8830.) (3 hours seminar per week; 6 hours clinical per week.)

NURS-8700.Counselling Process in Nursing
Development and refinement of counselling skills with an emphasis on human relationships and nursing strategies that facilitate health. Experiential learning will be implemented to bring a balance between counselling theory/research and applied counselling knowledge.

NURS-8710 Nutrition, Lifestyle, and Chronic Disease
Nutrition is the science that studies food and how the food nourishes the body and affects our health. This course will introduce the basic concepts of nutrition and present techniques and tools that can be used to encourage better eating habits in individuals. The course will introduce how nutrition can be incorporated into the clinical practice of health professionals. The topics that the course will cover include the processes of digestion, absorption and elimination as well as review basic nutrition therapy for some of the most common gastrointestinal conditions and disorders. There will be a brief overview of vitamins and minerals, discussion of key nutrition components that change throughout the life cycle and how diet plays a role in the development and treatment of chronic disease.

NURS-8720.Women and Health
An analysis of health issues of Canadian women from a holistic woman-centered perspective to include geographical, sociocultural and political variables that impact women's health.

NURS-8760. Management of Human Resources in Nursing
A study of concepts, theories, and practices that will assist nurse leaders to develop effective approaches to human resource management in nursing education and service settings.

NURS-8780. Seminar in Current Nursing Issues
An historical and futuristic examination of the critical issues facing the nursing profession and discipline. Considering the practice orientation of nursing, students will explore issues related to education, practice, discipline, and professionalism.

NURS-8800. Selected Readings in Nursing
Intended for students with a special interest in and knowledge of a specialty area in nursing. To explore theory and research related to an area of interest in nursing. (To be taken only with permission of the School.)

NURS-8805. Principles of Leadership and Healthcare in Disaster and Emergency Preparedness
This course teaches nurses the principles required to prevent/mitigate disasters and emergencies as well as the principles required to prepare for, facilitate, and coordinate prompt and effective management and recovery for a wide variety of major emergency and disaster situations within local, national, and

global contexts. Four key emergency management components are addressed: prevention and mitigation, preparedness, response and recovery. An all hazards approach is emphasized, including natural and human-induced disasters such as hurricanes, explosions, disease outbreaks and terrorism. Disaster public health, chemical/biological/chemical/nuclear and radiological threats, and leadership during crisis will be addressed. The importance of empowering communities through prevention/education and fostering community resilience will be identified. Topics that will be covered include the principles guiding emergency management, disaster life cycle, legal and ethical issues, crisis communications, disaster research, mass gatherings, complex humanitarian emergencies, care of the vulnerable populations, and the clinical nuances of disaster nursing. A number of historical disasters will be discussed to highlight these topics. Although developed for nurses, the content is also relevant for individuals in other health related disciplines who may be involved in the emergency management of public health emergencies.

NURS-8840. Summer Institute of Clinical Health Research
This intensive one-week Summer Institute will provide participants (i.e. graduate students, clinicians, and academics from various health related fields) with 35 hours of in-depth exploration and discussion of the principles and applications of clinical health research. Participants will be engaged by a team of experts in discussions pertaining to the understanding and applications of topics such as qualitative research and evidence-based practice, the use of mixed methods in clinical health research, epidemiologic research designs, clinical trials, and statistical modeling techniques in clinical health research. Other topics will include successful grant writing, running a successful research program, and ethical issues in clinical health research.(Prerequisites: Basic Research and biostatistics course(s); Permission of instructor)

NURS-8870. Integrative Practicum in Primary Health Care
Synthesize competencies essential to advanced practice nursing to provide primary health care for clients across the life span. Demonstrate autonomy in decision-making, and critical analysis of organizational and system issues that influence scope of practice, professional accountability, and outcomes. (Prerequisites: All ONPEC courses; NURS-8810, NURS-8820 and NURS-8830.) (3 hours seminar per week; 32 hours clinical per week.)

NURS-8970. Thesis Option
Before writing the thesis, the student must meet with the Master's committee to obtain approval of the thesis investigation. Permission will only be granted when the student has shown sufficient preparation and competence to carry out the thesis proposal. Upon completion, each candidate will be required to make a satisfactory oral presentation and defence of the thesis.

NURS-9100. Philosophy of Science in Nursing
This course introduces students to the philosophical assumptions concerning knowledge and knowledge development that inform the conduct of research in the discipline of nursing. Students will explore key concepts in relation to a variety of paradigm/perspectives within the philosophy of science, ranging from positivism to post-modernism and critical theory. Major topics to be debated will include the notion of nursing as a science and what constitutes nursing knowledge. Individual seminars will enable in-depth analysis of selected philosophers (as representative of such paradigms) in their respective socio-political and historical contexts. This course will enable students to articulate and defend their own philosophical assumptions of the paradigm that informs their dissertation topic.

NURS-9200. Advanced Perspectives in Quantitative Research Methods and Analyses
This advanced course is designed to enhance students' knowledge of the design and analysis of selected observational (prevalence, ecologic, cohort, and case-control) and experimental (controlled trials) quantitative research designs. The course will also address principles and issues pertaining to the

development, evaluation, and use of psychometric measures. Emphasis will be focused on the understanding and decision-making pertaining to (a) the selection of the right research design, (b) the identification of issues associated with various research methodologies, (c) the use of psychometric measurement, and (d) multivariate statistical procedure such as linear regression analysis, Binary and multinomial logistic regression analysis, and survival analysis. Approaches to evaluation of the quality of evidence in published research will also be addressed. (Prerequisite: NURS-9100; NURS-9300; Graduate level course)

NURS-9300. Advanced Perspectives in Qualitative Research
This course provides advanced philosophical and theoretical knowledge required to conduct qualitative research. Students are challenged to critically appraise the scholarship of published studies and to explore arising issues with qualitative inquiry. Issues may include, but are not limited to the importance and integration of philosophical underpinnings, researcher positioning, methodological congruence/consistency, ethical issues (anonymity, confidentiality of participation, privacy), challenges inherent in data collection and analysis, metasynthesis, rigour, and the usefulness of qualitative health research for nursing practice and healthcare policy. The relationship between qualitative and mixed methods health research will be examined. Students will defend their application of knowledge about these issues in relation to their own dissertation research interests. (Prerequisite: NURS-9100, Fall semester)

NURS-9410. Comprehensive Exam
This course allows students to demonstrate, in writing and orally, their ability to complete an extensive review and critical analysis of the literature to synthesize current knowledge and theoretical underpinnings pertaining to their research area. The critical review will also examine potential methodological and analytical approaches that are relevant to their research. The examination includes a written paper and an oral defence of the work.(Prerequisites: (NURS-9100, NURS-9200, NURS-9300, one Graduate Level course).

NURS-9980. Dissertation
This course provides doctoral students with the opportunity to demonstrate their role as mature scholars through the development and implementation of a research dissertation project that will address an original question/hypothesis relevant to advancing nursing science. Students will integrate knowledge gained from previous courses to inform the literature review, conceptual framework, methodology and data analysis pertaining to this project. (Prerequisites: NURS-9100, NURS-9200, NURS-9300, NURS-9410 one graduate level course (Nursing or another faculty) (Offered on a Pass/Non-Pass basis.)

FACULTY OF SCIENCE

GENERAL COURSES (SCIE-)

SCIE-8000. Theory and Practice of University Teaching and Learning in STEM
In this course, students will explore and critically evaluate current educational theory and practice relating to university teaching and learning in STEM (science, technology, engineering and mathematics). Students will be asked to critically evaluate their teaching beliefs and broaden their knowledge and skills by participating
in classroom discussions and microteaching opportunities. (Prerequisites: Admission to a thesis-based master's or PhD program in the Faculty of Science and consent of the instructor.) (3 credits.)

SCIE-8001. STEM Teaching Development
In this course, students will be asked to select an undergraduate or graduate course in their discipline and work with a faculty mentor to redesign, teach and assess one unit in that course. A "unit" is defined as the equivalent of three 50-minute lectures, or one 3-hour laboratory session or tutorial. Through the practicum, students will explore course and curriculum design elements by producing a detailed lesson plan, and a strategy for assessment and evaluation of the success of teaching the unit. Students will be asked to critically reflect on their experience in this course by submitting reflective essays and participating in group discussions. Final experiences will be shared through a symposium poster presentation. (Prerequisites: SCIE-8000 and admission to a thesis-based master's or PhD program in the Faculty of Science and consent of the instructor.) (3 credits)

BIOMEDICAL SCIENCES AND BIOLOGY (JOINT DEPARTMENT OFFERING)

PROGRAMS

PhD in Biological Science (PhD)

This is a joint offering between the Department of Biomedical Science and the Department Biology.

Admission Requirements
Applicants with an honour's degree in Biological Sciences or related field and who have been judged to be outstanding students may be admitted directly into the PhD. program. Applicants holding an M.Sc. degree or equivalent from the University of Windsor or from another recognized university or college may be admitted to the PhD. program with advanced standing in course work as described below.

Degree Requirements
Students may pursue one of the following fields within the PhD in Biological Sciences: 1) Molecular/Cellular Biology; 2) Ecology, Evolution, Environment, and Behaviour; and 3) Behaviour and Neuroscience.

Course Work: Students proceeding toward the PhD degree will follow one of the programs given below:

1) Students proceeding directly to the PhD. from an Honours B.Sc. degree will be expected to:

(a) comply with the general regulations.
(b) attend all departmental seminars in Biological Sciences (formal presentations of visiting speakers; graduate student seminars, thesis defence presentations and dissertation defence presentations) each year of full-time registration;
(c) present a departmental seminar in each year of enrollment (the dissertation defence may count as one of these);
(d) successfully complete a minimum of three (3) graduate courses. With the approval of the Doctoral Committee, courses may be in a cognate area;
(e) complete a dissertation embodying the results of an original investigation;
(f) defend the dissertation at a public lecture or seminar.

Students recommended and approved for transfer into the PhD. program after having completed between 12 and 15 months and one course (1) with at least an A- grade of a M.Sc. degree in Biological Sciences at the University of Windsor will normally receive one credit during the M.Sc. program and require two more credits at the PhD. level for a total of three (3) courses.

2) Students entering into a PhD. program with an M.Sc. degree will be expected to:

(a) comply with the general requirements;
(b) attend all departmental seminars in Biological Sciences (formal presentations of visiting speakers, graduate student seminars, thesis defence presentations and dissertation defence presentations) each year of full-time registration;
(c) present a departmental seminar in each year of enrollment (the dissertation defence may count as one of these);
(d) successfully complete a minimum of two graduate courses which may be in a cognate area. With the approval of the Doctoral Committee, courses may be in a cognate area;
(e) complete a dissertation embodying the results of an original investigation;
(f) defend the dissertation at a public lecture or seminar.

Grading: A student must maintain at least a 70% in each course in Biological Sciences and at least a 70% average in any non-Biological Sciences courses. Any student whose performance is deemed unsatisfactory in course work or research will be asked to withdraw.

Doctoral Committee: Within the first term of the student's registration, the doctoral committee will be formed except for the external examiner, who is to be appointed during the student's final year of study/research. The full committee will consist of at least five members; one must be from outside the University, one from the University faculty but outside Biological Sciences, and three must be within Biological Sciences. The research advisor will act as chairperson of this committee. The student should meet with individual committee members on an informal basis at least twice a year.

The doctoral committee must meet for the following:

(a) to review and approve course work and the research proposal no later than six months into the program;
(b) to prepare and administer the comprehensive examination within the first two years of the student's registration in the program;
(c) to discuss the student's progress within two months after the comprehensive examination. (The extramural committee member need not participate.);
(d) to discuss the student's research and dissertation at least two months before the anticipated time of the final oral examination;
(e) the final oral examination.

Research Progress: Each year from the date of initial registration, the student must submit a Research Progress Report to and meet with his or her doctoral committee. In addition, the student must review his or her research in a meeting with the doctoral committee at least six months before the anticipated date of the final oral examination.

Dissertation: Six months before the anticipated date of the final oral examination the student must review the research and dissertation in a meeting with the committee.

A dissertation embodying the results of an original investigation in the student's major field is required of all candidates. The dissertation is expected to be of a quality suitable for publication in a refereed biological journal.

Examinations:
(a) Comprehensive Examination: The primary purpose of the Comprehensive Examination is to ensure that the student demonstrates both a reasonable mastery of the field of specialization, and knowledge of broader areas of Biology; it is designed to test the student's command of knowledge and ability to integrate that knowledge. This examination must be completed within two years of the student's initial

registration in the program. Prior to the examination, the student will have provided the doctoral committee with a written proposal outlining the background, approach and general expectations of the intended research project; however, the Comprehensive Examination is not intended to be, and should not be limited to, a defence of this proposal. The Comprehensive Examination will normally be an oral examination administered by the doctoral committee and chaired by the Biological Sciences Graduate Coordinator (or designate). The student's Academic Advisor will communicate the results of the examination and any recommendations to the student, and to the Biology Graduate Committee. Following the Comprehensive Examination the doctoral committee may assign the student appropriate remedial or supplementary course work. Successful completion of the examination and any remedial studies or course work recommended by the doctoral committee is prerequisite to the student's admission to candidacy in the doctoral program.

(b) Finally, the student will be requested to defend the dissertation orally at a public lecture or seminar (final oral examination).

Master’s in Biological Sciences (MSc)

This is a joint offering between the Department of Biomedical Science and the Department of Biology.

Admission Requirements
Applicants with an honours degree in Biological Sciences or a related field may be admitted to the Master's Candidacy (M2) program.
Applicants with a general B.Sc. degree in Biological Sciences or a related field may be admitted to the Master's Qualifying (M1) program.
For the Behaviour and Neuroscience field, agreement with a research supervisor for supervision will also be required.

Degree Requirements

Students may pursue one of the following fields within the MSc in Biological Sciences:
Molecular/Cellular Biology
Ecology, Evolution, Environment, and Behaviour
Behaviour and Neuroscience

1) Students admitted to the Master's Candidacy program will be expected to:

(a) comply with the general regulations;
(b) attend all departmental seminars in Biological Sciences (formal presentations of visiting speakers, graduate student seminars, thesis defence presentations and dissertation defence presentations) each year of full-time registration;
(c) present a departmental seminar in each year of enrollment (the thesis defence may count as one of these);
(d) successfully complete a minimum of two graduate courses with approval of the Master's Committee, courses may be in a cognate area;
(e) complete an original research project and embody it in a thesis;
(f) defend the thesis orally at a public lecture or seminar.

2) Students admitted to the Master's Qualifying program, besides meeting the minimum requirements of the Master's Candidacy program, are expected in the first year of the two-year program to achieve a level of qualification equivalent to an honours degree through research and a minimum of four courses.

3) Grading: A student must maintain at least a 70% in each Biological Sciences course and at least a 70% average in any non-Biological Sciences courses.

4) Master's Committee: Within one term of the student's registration in the program, the research committee will be formed, and the names submitted to the Dean of Graduate Studies. The full committee will consist of at least three members - the research supervisor, one other faculty member from within Biological Sciences, and one University faculty member from outside of Biological Sciences.

The student should meet with individual committee members on an informal basis at least twice a year. The committee, in turn, must meet to:

(a) review and approve course work and the research proposal no later than six months into the program.
(b) discuss the student's research and thesis at least six months before the anticipated time of the final oral examination.
(c) participate in the final oral examination.

Research Progress
Each year from the date of initial registration, the student must submit a Research Progress Report to and meet with his or her Master's committee. In addition, the student must review his or her research in a meeting with the Master's committee at least six months before the anticipated date of the final oral examination.

Research Thesis
A thesis embodying the results of an original investigation in the student's major field is required of all candidates. The student must defend the thesis orally at a public lecture or seminar, which will be the final oral examination.

Students may pursue one of the following fields within the MSc and PhD in Biological Sciences: 1) Molecular/Cellular Biology; 2) Ecology, Evolution, Environment, and Behaviour; and 3) Behaviour and Neuroscience.

BIOMEDICAL SCIENCES / BIOLOGY COURSES (Joint Departmental Offering) (BIOL-)

Note: These courses are a joint offering between the Department of Biomedical Science and the Department of Biology.

Fundamentals Courses: Fundamentals courses cover subject matter that is considered central to a comprehensive knowledge of principles and theories in the department's areas of research emphasis. The scope of these courses extends beyond that provided at the undergraduate level. These courses may entail formal lectures, laboratory instruction and/or directed readings and discussion, but the onus is on the course instructor to ensure that students are exposed to balanced and comprehensive coverage of the range of topics considered to represent the field. Because of their central importance to the Biological Sciences, these courses are offered on a regular, recurring basis.

Special Topics Courses: Special topics courses provide detailed expertise in theory and/or techniques in areas of researchers' expertise that are especially relevant to students' thesis research. Although no less rigorous than fundamentals courses, these courses may provide greater depth of information over a narrower subject range. The scope of these courses extends beyond that provided at the undergraduate level. These courses may involve a combination of lectures, laboratories, discussion, readings and/or

student presentations under the guidance of the instructor. A Special Topics course will have an explicit subtitle indicating the theme of a particular offering. Some Special Topics courses will be offered each year. The themes will vary among years to reflect the expertise of the instructors available and the current needs of the graduate students.

Selected Readings Courses: The primary goal of the Selected Readings courses is to develop students' skill in objective, critical analysis of scholarly work among individuals with broadly similar research interests and backgrounds. An equally important aspect of these courses is to promote interaction among students and faculty and to help participants become aware of new research across a range of subdisciplines. The role of students in selecting and presenting relevant material is central to these courses.

BIOL-8004. Selected Readings in the Biological Sciences
Current publications on common themes of potential significance in students' area of study will be chosen for round table oral presentation and discussion. Multiple sections, each with enrollment of 8-12 students will be offered in the fall term of each year as required. This course is intended for graduate students in Biological Sciences only. (2 discussion hours a week.)

BIOL-8008. Special Topics in Biological Sciences
Special Topics in the Biological Sciences courses may be used to introduce a new graduate offering, typically on a "trial" basis. Approved courses taken at Wayne State University or elsewhere, or courses offered by visiting professors may also fall into the category of Special Topics in the Biological Sciences. A limited number of these courses may be included in the program of graduate student.

BIOL-8014. Selected Readings in the Biological Sciences
Current publications on common themes of potential significance in students' area of study will be chosen for round table oral presentation and discussion. Multiple sections, each with enrollment of 8-12 students will be offered in the winter term of each year as required. This course is intended for graduate students in Biological Sciences only. (2 discussion hours a week.)

BIOL-8018. Techniques in Molecular Biology
A course designed to introduce the student to a variety of biochemical, cellular, and molecular techniques. This course is composed of a series of topics from which students are required to participate in a minimum of four. The topics include: chromatography, electrophoresis, immunocytochemistry, electron microscopy, cell culture, cloning and nucleic acid analysis, computer-based protein and nucleic acid analysis, and radioisotope methods. Students should consult with their research advisors and supervisory committees in choosing the topics for study. (Prerequisite: consent of instructor.) (2 lecture hours, 4 laboratory hours a week for selected experiments during the year, both terms.) (One term course credit.) (Offered in alternative years.)

BIOL-8208. Special Topics in Population and Environmental Biology
This is a regularly offered course covering subjects that reflect current graduate program needs and departmental expertise in specific areas. The course addresses one or more theme subjects in any particular term. Students receive a course credit for each term in which they register for this course provided that a particular theme is not repeated. Where a theme parallels an undergraduate course listing, students may be required to attend some portion of the undergraduate course as a prerequisite or corequisite. Subjects that may be offered as special topics include but are not limited to the following: animal behaviour; advanced topics in aquatic ecology; biogeography, conservation biology, ecotoxicology, quantitative ecology. (Prerequisite: consent of instructor.) (2-3 discussion hours and/or up to 5 laboratory hours a week.)

BIOL-8270. Fundamental Topics in Population and Evolutionary Biology
Major topics may include the evolution of mating systems, population structure and demography, population genetics and life history variation, theory of optimal resource use. (Prerequisite: consent of instructor.) (3 lecture/discussion hours a week.) (Offered in alternate years.)

BIOL-8280. Fundamental Topics in Community Biology
Major topics include niche and diversity theory, trophic complexity and community stability, assembly of guilds, ecosystem structure and function, biogeography. (Prerequisite/corequisite: BIOL-3250, or consent of instructor.) (3 lecture/discussion hours a week.) (Offered in alternate years.)

BIOL-8508. Special Topics in Molecular and Developmental Biology
This is a regularly offered course covering subjects that reflect current graduate program needs and departmental expertise in specific areas. The course addresses one or more theme subjects in any particular term. Students receive a course credit for each term in which they register for this course provided that a particular theme is not repeated. Where a theme parallels an undergraduate course listing, students may be required to attend some portion of the undergraduate course as a prerequisite or corequisite. Subjects that may be offered as special topics include but are not limited to the following: biology of cell transformation; electron microscopy; genetic engineering and its applications; advanced topics in immunochemistry; advanced topics in microbial physiology and ecology; advanced topics in physiology; plant hormones and development; virology. (Prerequisite: consent of instructor.) (2-3 discussion hours and/or up to 5 laboratory hours a week.)

BIOL-8520. Molecular Biology of Growth and Development I
An analysis at the molecular level of the growth and development of prokaryotes, lower eukaryotes, and their plasmids. (Required: consent of instructor.) (2 discussion hours a week.) (Offered in alternate years.)

BIOL-8530. Molecular Biology of Growth and Development II
An analysis at the molecular level of the growth and development of plants and animals. (Required: consent of instructor.) (2 discussion hours a week.) (Offered in alternate years.)

BIOL-8900. Experimental Design and Analysis in Biological Research
Discussion of philosophical and quantitative approaches used to investigate biological systems, with emphasis on design and implementation of efficient and unbiased experiments. Students will use expertise acquired in lectures and readings to constructively evaluate their own and others' research proposals through round table discussions and individual presentation. (Prerequisite/corequisite: BIOL-3022, or consent of instructor.) (2 discussion hours a week.)

BIOL-8970. Thesis Research
An original research project embodied into a concisely written thesis which conforms to the style and format of a recognized journal in the field of specialization. The student should register for this course during each term (including Summer) of residency at the University; however, this course may not be used for credit toward fulfilling the course requirements in the Master's program.

BIOL-9980. Dissertation Research
An original research investigation the results of which will be embodied in a concisely written dissertation conforming in style and format to a recognized journal in the field of specialization. The final paper should be of the highest quality possible and suitable for publication. The doctoral student should register for this course commencing the summer term of the first year of residency and subsequently for each term during which dissertation research will be carried out. In no case, however, may this course be used for credit toward fulfilling the course requirements in the PhD. program.

BEHAVIOR, COGNITION AND NEUROSCIENCE FIELD

BIOL-8410. BCN Training Course
This short, intensive course examines specialized topics in Behaviour, Cognition and Neuroscience through collaborative presentations with leaders in the field. Students are required to understand the background of the specialized topic, and to participate in colloquia and laboratory experiments with visiting BCN scientists.

BIOL-8450. Sensory Ecology
This seminar/lecture course will examine interconnections between sensory biology and ecology as they relate to the evolution of signal reception. Special emphasis is placed on a comparative approach to understanding sensory neurobiology and the current state of the field of sensory ecology. (Note: It is recommended that students taking this course have completed Principal Neuroscience (55-258) or equivalent.)

BIOL-8400. Behavior and Physiology of Fishes
The goal of this course is to increase one's understanding of current research in the behaviour and physiology in fishes by synthesizing and evaluating current literature, leading class discussions, assessing presentations of others and by preparing a review paper based on research ideas presented in the course. (Prerequisite: Any two of the following undergraduate courses or their equivalents from other universities: 55-204, 55-210, 55-425 or 55-440.)

BIOL-8470. Comparative Cognition
Evidence of general and specialized cognitive processes in human and non-human organisms will be investigated. Topics to be covered include perception, attention, and memory, concept formation, ecological and evolutionary bases of cognitive processes. Current research on these and other topics will be reviewed and discussed in a seminar format. (Prerequisite: Any two of the following undergraduate courses or their equivalents from other universities: PSYC-3530, PSYC-3580 or PSYC-3350.) (Also offered as PSYC-8570) (May be offered as a cross-career course with PSYC-4570.)

BIOL-8408. Advanced Behavioural Neurobiology
In depth case analyses will be conducted to show how animals have developed neural mechanisms to solve behavioral problems encountered in their specific environmental niches. Topics will cover sensory processes, motor strategies, and plastic changes of behavior. General principles in behavioral neurobiology will be discussed after examination of individual cases. Important research methods in behavioral neurobiology will also be introduced. (Co-requisite: BIOL-4508) (Note: It is recommended that students taking this course have completed Principle Neuroscience 55-258 or equivalent.)

BIOL-8418. Advanced Topics in Neurophysiology
This course emphasizes synaptic organization of the brain. It examines how physical stimuli are converted by neurons into sensations and how movement is controlled through integrative neuronal action. The mechanisms of learning and memory will be discussed at the neuronal and molecular levels. Important experimental approaches in contemporary neurophysiology will also be introduced. (Note: It is recommended that students taking this course have completed Principle Neuroscience (55-258) or equivalent.)

BIOMEDICAL SCIENCES

PROGRAM

Master of Science (MSc) in Translational Health Sciences (THS)

Admission Requirements
Students entering the program require:

- A Bachelor of Science degree, or Nursing, or a related field.
- A minimum cumulative GPA of 70% or better in the final two years of study (full time equivalent).
- At least one undergraduate statistics course for science, health, or math disciplines.
- Two letters of reference.
- For applicants whose native language is not English, a satisfactory score on an English proficiency test is required.

Applicants are exempt from submitting an English language proficiency examination score if any one of the following conditions is true:
1.Within the past two years you have completed a university degree at a Canadian institution.
2.Within the past two years you have completed a university degree at an institution where English was the primary language of instruction, as indicated on our exemption list.

Applicants that do not fall under the conditions about must meet a minimum IELTS of 7.0 (or equivalent, e.g., TOEFL iBT Score minimum 94, etc.) with no IELTS band score less than 6.5.

Selection criteria will include a weighted score for: (1) undergraduate academic average; (2) strength of references; and (3) prior research training, experience, and accomplishments. Candidates will be reviewed and accessed for eligibility by the admissions committee for the program, which will be composed of faculty teaching in the program and the program coordinator. Enrolment will be limited to 40 students annually, due to clinical spaces available for experiential learning.

Degree Requirements

Total courses: Eight graduate level courses:

1) Six (6) required courses including:
BIOM 8710. Cancer Cell Biology
NURS-8410. Evidence Utilization
NURS-8420. Health Research Methods
BIOM-8720. Fundamentals of Oncology
BIOM-8700. Professional Development Seminar in Translational Health Sciences
BIOM-8705. Experiential Learning Placement in Translational Health Sciences

2)Two additional courses selected from the following:
BIOL-8008. Special Topics in Biological Sciences (Medical Genomics)
BIOL-8008. Special Topics in Biological Sciences (Tumour Immunology and Immunotherapy)
BIOM-8008. Special Topics in Biomedical and Translational Health Science
BIOC-8684. Cell Death, diseases, and Natural Health Products
COMP-8580. Topics in Bioinformatics

NURS-8300. Advanced Health Assessment, Diagnostics and Therapeutics of the Oncology/Palliative Patient
NURS-8450. Promoting Health Equity Among Diverse Groups
NURS-8440. Improvement Science

A student must achieve a grade of at least 70% in to retain credit in each of the required and elective courses.

Master of Science (MSc) in Biomedical Sciences

Prospective students are advised that the program is still subject to formal approval by the Ontario Quality Council and the Ministry of Colleges, Universities, Research Excellence and Security.

Admission Requirements

- A Bachelor of Science degree or a degree in a related field.
- A cumulative GPA of 70% or better in the final two years of undergraduate study (full-time equivalent) may be
- admitted
- At least one undergraduate statistics course for science, health, or math disciplines.
- Two letters of reference.
- For applicants whose native language is not English, evidence of English proficiency must be provided. (Please see the Policy on English Language Proficiency Requirement)

Selection criteria will include: (1) undergraduate academic average; (2) strength of references; and (3) prior research training, experience, and accomplishments. Candidates will be reviewed and assessed for eligibility by the departmental graduate committee for the MSc program, which will be composed of faculty teaching in the program and the program Chair. Processes will be consistent with UWindsor admissions policies.

Degree Requirements

Total courses: Total courses: 2 graduate courses + BIOM-8970. Thesis Research

Select 2 graduate courses from:
(a) BIOM-8009. Special Topics in Biomedical Sciences*
*Special topics may include:
o Skills for Success
o Cellular and Molecular Neuroscience
o Tumour Immunology and Immunotherapy
o Nutrition
o Advanced Biomedical Research Methods
o Current Genomics

(b)BIOM-8970. Thesis Research
Students will have to register in the thesis course (BIOM-8970) every semester of their degree

PhD in Biomedical Sciences

Prospective students are advised that the program is still subject to formal approval by the Ontario Quality Council and the Ministry of Colleges, Universities, Research Excellence and Security.

Admission Requirements

- A Master of Science degree or a degree in a related field.
- A cumulative GPA of 77% or better during their MSc degree.
- For students without an MSc degree, they may be first accepted into the MSc program and then, within the first year, apply to switch into a PhD program. This will require the supervisory committee to oversee their performance (including graduate course grades) and administer a 'transfer exam' prior to approval.
- For applicants whose native language is not English, evidence of English proficiency must be provided. Refer to the Policy on English Language Proficiency Requirement.

Selection criteria will include a weighted score for:
(1) undergraduate and graduate academic average;
(2) strength of references; and
(3) prior research training, experience, and accomplishments.

Candidates will be reviewed and assessed for eligibility by the departmental graduate committee for the PhD program, which will be composed of faculty teaching in the program and the program Chair. Processes will be consistent with UWindsor admissions policies.

Applicants must satisfy the general admission criteria for the Faculty of Graduate Studies (MSc admission average 70%, PhD admission average 77%, etc).

Program-specific requirements include minimum scores for: 1) TOEFL-IBT of 83; IELTS of 6.5; Pearson of 65.

Applicants also have to complete a Statement of Research Interest Form outlining their specific interests in the
Program, which is typically written following communication with a potential Faculty supervisor in the Department of Biomedical Sciences. This statement outlines the students' interest in a specific project that has been arranged prior to application. Generally, students will contact the proposed faculty member/supervisor prior to sending in an application. However, some students may apply directly to the department and their names and information will be circulated within the department, allowing faculty to view the application and decide whether to contact the student directly.

Non-traditional applicants (including those whose work experience is a factor) will be considered on a case-by-case basis in keeping with UWindsor admissions policies.

Degree Requirements

Total courses: 2 graduate courses + BIOM-9980. Dissertation Research
(a) Select 2 Graduate Courses from:
BIOM-8009. Special Topics in Biomedical Sciences*
*Special topics may include:
o Skills for Success
o Cellular and Molecular Neuroscience
o Tumour Immunology and Immunotherapy
o Nutrition
o Advanced Biomedical Research
o Current Genomics

(b) BIOM-9980. Dissertation Research
Students will have to register in the dissertation course (BIOM-9980) every semester of their degree.

BIOMEDICAL SCIENCES COURSES (BIOM-)

BIOM-8008. Special Topics in Translational Health Science
Selected topics of current interest in the fields of Biomedical Sciences which may vary from year to year. (May be repeated for credit only if content changes. (Prerequisite: Admission into the professional Translational Health Sciences Master's program or permission of instructor.) (Registration in all courses required for the semester.)

BIOM-8009. Special Topics in Biomedical Science
Selected topics of current interest in the fields of Biomedical Sciences which may vary from year to year. (May be repeated for credit only if content changes). (This is an experiential learning course).

BIOM-8700. Professional Development Seminar in Translational Health Sciences
Students will gain transferrable skills necessary for their professional development in translational health sciences careers. Students will work in groups to study current challenges in translational health sciences that are presented by guest speakers from academia, health care professions, and industry. In developing solutions to these challenges, students will have opportunities to practice and receive peer and instructor feedback on their professional writing, problem solving skills, networking, and oral presentation skills. To help prepare students to enter the workforce, each student will prepare a career plan that includes strategies for professional networking and lifelong learning, as well as a professional portfolio for use in job interviews. As part of the portfolio students will reflect on their own development and growth during the program, as well as create writing samples for employment applications (i.e., curriculum vitae and cover letters). Students must be enrolled in this course in each of the three semesters of the 12-month professional Master's program.

BIOM-8705. Experiential Learning Placement in Translational Health Sciences Research
Students will gain practical experience working in small groups on a translational health sciences research project together with a research advisor (e.g., academic faculty or health care professional) and the instructor. Students will participate in a 216-hour experiential placement that will be supplemented with weekly lectures, meetings, and/or presentations. At the start of the 12-month experiential placement, student groups will collaboratively develop a project proposal that outlines the study design, methods, and regulatory approvals. Proposals will undergo a process of peer review and revision, in consultation with the research advisor and instructor. Throughout the course, students will prepare individual monthly progress reports, which will culminate in a final group report that documents the research data, analysis, and outcomes for the project. In addition, student groups will present their findings as a poster at the Translational Health Sciences Master's Colloquium in the final semester. Students must be enrolled in this course in each of the three semesters of the 12-month professional Master's program. (Credit weight: 9.0)

BIOM-8710. Cancer Cell Biology
Contemporary diagnostics and treatments of cancer have dramatically decreased mortality. Nevertheless, cancer continues to claim more than 83,000 lives annually in Canada. In Cancer Cell Biology our primary focus will be on the mechanisms that are corrupted in cancer cells and the differences in vulnerability among tissues. Secondarily, will review technologies used to define pathways and reflect on the lessons learned from the application of such techniques. Finally, we will examine the strategies being used today to exploit the vulnerabilities of tumors for personalized and targeted therapeutics. (Prerequisite: Admission into the professional Translational Health Sciences Master's program or permission of instructor. Corequisite: Registration in all courses required for the fall semester.)

BIOM-8720. Fundamentals of Oncology
Using a problem-based learning approach, students will explore the diagnosis, pathophysiology, treatment, and prevention measures for various cancers. Multiple cases will be introduced each semester, consisting of a mix of lectures and tutorials. Cases will be developed and presented by the instructor and will include guest speakers engaged in clinical oncology research and/or patient care. The course will provide students with experience in using a problem-based learning approach to consider and propose solutions to current and relevant cases. In addition, the course will challenge students to identify the intersections and interdisciplinary aspects of cancer patient care, including an examination

of the career paths of professionals working in the oncology health care system. (Students must enroll in this course in Summer, Fall, and Winter for one hour per week over three terms at 12 weeks/term, or 36 hours in total)

BIOM-8970. Thesis Research
An original research project embodied into a concisely written thesis which conforms to the style and format of a recognized journal in the field of specialization. The student should register for this course during each term (including Summer) of residency at the University; however, this course may not be used for credit toward fulfilling the course requirements in the Master's program. (This is an experiential learning course).

BIOM-9980. Dissertation Research
An original research investigation the results of which will be embodied in a concisely written dissertation conforming in style and format to a recognized journal in the field of specialization. The final paper should be of the highest quality possible and suitable for publication. The doctoral student should register for this course commencing the summer term of the first year of residency and subsequently for each term during which dissertation research will be carried out. In no case, however, may this course be used for credit toward fulfilling the course requirements in the PhD. program. (This is an experiential learning course.)

CHEMISTRY AND BIOCHEMISTRY

PROGRAMS

Chemistry and Biochemistry (MSc)

In addition to the University's general requirements and stipulations for the Master's degree, the following requirements must be met by students proceeding to the MSc degree.

1) Course Work: Students must successfully complete at least three courses. Two courses must be taken from Chemistry and/or Biochemistry, and the third from a cognate area. Cognate courses must be approved by the Graduate Program Committee of the Department of Chemistry and Biochemistry. The student may be required to take additional courses, as stipulated by the student's Master's committee.
2) Seminars: In addition to the above course work, students must attend the regular departmental Seminar (CHEM-8900) throughout their M.Sc. studies as a fulfilment of this requirement.
3) Thesis: A student must undertake original research and embody the results in a thesis (CHEM-8970). The student will then be examined by a committee.
A student who fails to achieve satisfactory performance in all aspects of the program (e.g., course work, seminars, thesis work or major critique) may be required to withdraw.
4) Master's Committee and Final Examinations: The Master's committee is chosen in the manner described under Master's Program Requirements. The final examination will take the form of an open seminar in the presence of the Master's committee. The examination will be open to the public.

Medical Biotechnology (MMB)

The Master of Medical Biotechnology (MMB) is a professional program that provides students with both a solid foundation of the theoretical concepts and practical industrially applicable laboratory technique experiences used in medical biotechnology industries. In addition, students will also receive training in business plan development and product commercialization.

Admission Requirements

In accordance with our current admission requirements for the MSc program, students entering this program must have a four (4) year BSc or BSc (Honours) degree in Biochemistry, Biology, Chemistry, or accepted equivalent from an academic institution approved by the University of Windsor.

They must have the equivalent of a 70% average or higher in their undergraduate studies when converted to Ontario standards.

Candidates must demonstrate English proficiency by meeting or exceeding an IELTS score of 6.5 with not more than one band (reading, writing, speaking, listening) at or below 6.0. For TOEFL-Internet Based Test, this would correspond to 83 overall with a minimum score of 21 in no more than one band. If an applicant

receives an IELTS score of less than 6.5 (or TOFEL- Internet Based Test less than 83) they may be offered a conditional letter of acceptance pending successful completion of an approved English Language Training program.

This is a premium program as such enrolment is limited. Preference will be given to candidates who exceed the minimum requirements and those who have demonstrated work experience in the field of biotechnology.

Degree Requirements

Total courses: 10 courses

(a) six core MMB courses:
BIOC-8700. Human Physiology and Mechanisms of Diseases
BIOC-8730. Drugs: From Discovery to Market
BIOC-8740. Protein Structure and Function
BIOC-8760. Clinical Biochemistry
BIOC-8780. Biotechnology Entrepreneurship
BIOC-8790. Biotechnology Laboratory

(b) two Science electives chosen from BIOC-8XXX, CHEM-8520, CHEM-8641, CHEM-8650
CHEM-8520. Free Radical in Chemistry and Biology
CHEM-8641. Bio- and Sustainable Materials
CHEM-8650. Membrane Biochemistry

(c) two Business courses:
BSMM-8140. Marketing
and one of
BSMM-8310. International Business
BSMM-8340. Leadership and Organizational Change

RECOMMENDED COURSE SEQUENCE

First semester: three courses,
BIOC-8700. Human Physiology and Mechanisms of Diseases
BIOC-8740. Protein Structure and Function
BSMM-8140. Marketing

Second semester: three courses,
BIOC-8730 Drugs. From Discovery to Market
BIOC-8760. Clinical Biochemistry
and one Science elective course. Seek academic advising for assistance with course selection.

Third semester: two courses,
BIOC-8790. Biotechnology Laboratory
and one Business course. Seek academic advising for assistance with course selection.

Fourth semester: two courses,
BIOC-8780. Biotechnology Entrepreneurship
and one Science elective course. Seek academic advising for assistance with course selection.

Standing Required for Continuation in the Program and for Graduation
Students must have a cumulative average of not less than 70% to remain in good standing, and continue in the program.

Master of Materials Chemistry and Engineering (MMCE) (Joint Program with Engineering)

Students entering the MMCE program:
(a) must have a four (4) year BSc (Honours) in Chemistry or BASc (Honours) degree in Materials Engineering or accepted equivalent from an academic institution approved by the University of Windsor. They must have the equivalent of a B (73%) average or higher in their undergraduate studies when converted to Ontario standards.
(b) demonstrated English proficiency by meeting or exceeding an IELTS score of 6.5 (or equivalent, i.e, 83 TOEFL Internet Based Test). If an application receives an English language proficiency score of less than 6.5 (or equivalent) they may be offered a conditional letter of acceptance pending successful completion of an approved English Language Training program.
(c) Applicants must submit current Resume, Statement of Purpose and two letters of reference.

To be admissible to the project-based stream, the minimum grade average of 80% must be met in the MMCE-8820 and MMCE-8821 courses, and the student must have support of the Program Coordinator.

Degree Requirements

Course-based Stream Requirements (8 courses + 1 six-credit (6.0) laboratory courses)
MMCE-8820: Introduction to Materials Engineering and Chemistry (6.0 credits)
MMCE-8821. Materials Engineering Laboratory/Materials Chemistry Laboratory
MMCE-8905. Advance Seminar in Materials Chemistry and Engineering
ECON-8260. Business Communications

Take four (4) Materials Chemistry/Materials Engineering courses from the following list:
MATL-8XXX. (8000 level Materials course)
CHEM-8528. Supramolecular Chemistry
CHEM-8600. Surface Chemistry and Analysis
CHEM-8630. Self-Organization by Molecular Design
CHEM-8640. Organic Nanomaterials
CHEM-8641. Bio- and Sustainable Materials
CHEM-8832. Magnetochemistry
or other relevant graduate Chemistry courses, as approved by the MMCE program coordinator.

Take one (1) Business course from the following list:
BSMM-8140. Marketing
BSMM-8310. International Business
BSMM-8340. Leadership and Organizational Change

Project-based Stream Requirements (6 courses + 1 six-credit (6.0) laboratory courses + 1 six-credit (6.0) Research Project course
MMCE-8820: Introduction to Materials Engineering and Chemistry (6.0 credits)
MMCE-8821. Materials Engineering Laboratory/Materials Chemistry Laboratory
MMCE-8905. Advance Seminar in Materials Chemistry and Engineering
ECON-8260. Business Communications

Take two (2) Materials Chemistry/Materials Engineering courses from the following list
MATL-8XXX. (8000 level Materials course)
CHEM-8528. Supramolecular Chemistry
CHEM-8600. Surface Chemistry and Analysis
CHEM-8630. Self-Organization by Molecular Design
CHEM-8640. Organic Nanomaterials
CHEM-8641. Bio- and Sustainable Materials
CHEM-8832. Magnetochemistry
or other relevant graduate Chemistry courses, as approved by the MMCE program coordinator.

Take one (1) Business course from the following list:
BSMM-8140. Marketing
BSMM-8310. International Business
BSMM-8340. Leadership and Organizational Change

Take the following course*:
CHEM-8831 Research Project course (6. 0 credits
*Admission contingent upon the student achieving a grade of 80% or higher in MMCE-8820 and MMCE-8821, plus permission of the program coordinator)

Recommended Course Sequencing:

Intersession
ECON-8260. Business Communications (module 1)

Summer Semester
MMCE-8820A. Introduction to Materials Engineering and Chemistry
MMCE-8821A. Materials Engineering Laboratory/Materials Chemistry Laboratory (Lab 1)
MMCE-8905. Advance Seminar in Materials Chemistry and Engineering (Module 1 of 4)
ECON-8260. Business Communications (Module 2)

Fall Semester
MMCE-8820B. Introduction to Materials Engineering and Chemistry
MMCE-8821B. Materials Engineering Laboratory/Materials Chemistry Laboratory
MMCE-8905. Advance Seminar in Materials Chemistry and Engineering (Module 2)
ECON-8260. Business Communications (Module 3)

Winter Semester
MMCE-8905. Advance Seminar in Materials Chemistry and Engineering (Module 3)
ECON-8260. Business Communications (Module 4)

Course-based stream: two courses taken from the Materials Chemistry and/or Materials Engineering courses
Project-based stream: one course taken from the Materials Chemistry and/or Materials Engineering courses and CHEM-8831 Research Project.

Summer Semester
MMCE-8905: Advance Seminar in Materials Chemistry and Engineering (Module 4)
Course-based stream: two courses taken from the Materials Chemistry and/or Materials Engineering courses

Project-based stream: one course taken from the Materials Chemistry and/or Materials Engineering courses and CHEM-8831 Research Project

Chemistry and Biochemistry (PhD)

In addition to the University's general requirements, the following requirements must be met by all students proceeding to the PhD. degree:

Course Work: Candidates must complete successfully at least six courses, including CHEM-9900 (or three courses if the candidate enters the program with an MSc degree) chosen from the available graduate offerings in the student's field or from related and cognate courses, with the approval of the Program Committee. The student may be required to take additional courses, as stipulated by the student's Doctoral committee.

Seminars: In addition to the above course work, students must attend the regular departmental Seminar (CHEM-8900) throughout their PhD. studies and present at least one seminar on their research as a fulfilment of this requirement.

Dissertation: The principal requirement for the PhD. degree is the presentation of a dissertation which embodies the results of an original investigation (CHEM-9980). For general requirements of the dissertation, see PhD, The Dissertation.

A student who fails to achieve satisfactory performance in all aspects of the program (e.g., course work, seminars, and dissertation work) may be required to withdraw.

Doctoral Committee: The PhD. committee is chosen in the manner described under PhD Program Requirements. This committee will meet with the student annually to review his or her progress. As part of this review the student will present a short seminar on his or her research progress.

Transfer to the PhD. program: M.Sc. students with a minimum of an 80% average in a minimum of two courses taken as a graduate student may transfer directly to the PhD. program following a meeting with the Graduate Advisory Committee (with participation of the Outside Reader optional) at which approval to transfer is recommended. Such transfers will normally take place between the 12th month to the 24th month after admission to the M.Sc. II program.

Comprehensive Examination: Students in the PhD. program will be required to complete an oral comprehensive examination within the first twelve months following admission into the PhD. program. The examination will take the form of a ten-to-twenty-minute presentation of the student's research work to date, followed by a question-and-answer session in which the student's depth of knowledge of the field of research and the underlying chemical and/or biochemical principles will be examined. The student will be assessed by a committee of three members comprised of the research advisor and two other faculty members from Chemistry and Biochemistry, with additional members optional. As a guide to the student, the committee may provide some directed readings prior to the examination. The student will be expected to understand the subject matter and background of these topics. A grade of Pass or Fail will be given. In the event of a failing grade, the student may be allowed a second examination within one month, or a specific assignment for subsequent evaluation at the discretion of the examining committee. It may be possible that the student will not be allowed to repeat the examination.

Final Examination: Each candidate will take a final oral examination in defence of the dissertation on the recommendation of the doctoral committee. An external examiner, chosen for acknowledged scholarship in the appropriate field of chemistry or biochemistry, will normally be present during the oral

examination. The external examiner will be selected by the doctoral committee, subject to the approval of the Dean of Graduate Studies. The examination will be public and will involve a short seminar presentation by the candidate. The examination will be chaired by the Dean of Graduate Studies or delegate.

All of the courses listed will not necessarily be offered in any one year. Topics courses may be taken several times provided the course content is different. Where prerequisites are not stated, consent of the instructor is required.

CHEMISTRY AND BIOCHEMISTRY COURSES

BIOCHEMISTRY (BIOC-)

BIOC-8000. Protein Chemistry I
Protein chemistry; chemical modification, protein folding, post-translational modification, lipoproteins, and glycoproteins. (Prerequisite: BIOC-3130 or equivalent.) (2 lecture hours a week.)

BIOC-8008. Special Topics in Biochemistry
(Prerequisites: BIOC-3100 and BIOC-3110, or equivalent.) (2 lecture hours a week.) (May be offered as a cross-career course with BIOC-3140 or BIOC-4008)

BIOC-8010. Protein Chemistry II
Biophysical chemistry, advanced kinetic techniques, pre-steady state, perturbation based methods, review of instrumentation, and examples of how these techniques are currently used to solve biochemical problems. (Prerequisite: BIOC-8000.) (2 lecture hours a week.)

BIOC-8020. Structural Proteomics and Its Applications
This course provides an introductory overview of the technologies and practices in structural proteomics and its applications. It will cover the history, current status, and the workflow of high-throughput approaches to structural biology. It will introduce the concepts of drugability, target selection and validation, chemical probes, chemogenomics in modern drug discovery and the critical role of structural proteomics in these applications. Also, progress in several important protein families, such as kinase, methyltransferase, deubiquitinase, will be discussed. This course is intended for graduate students in life science major who have interests in protein structural biology, want to interface with structural biologists or utilize the knowledge in their study and research. (2 lecture hours/week.) (May be offered as a cross-career course with BIOC-4008)

BIOC-8030. Integrative Biological Mass Spectrometry
This course will focus on the theory and applications of biological mass spectrometry. The most common types of ionization methods and mass analyzers will be thoroughly presented including data interpretation. A major part of the course will be to discuss the applications of this technique in identifying multiprotein complexes, mapping post-translational modifications, structural biology, and quantitative proteomics. Various techniques that are commonly interfaced with the mass spectrometer will be introduced in order to emphasize proper sample preparation and stimulate discussion on applying mass spectrometry to common biological research fields. (2 lecture hours/week.)

BIOC-8203. Scattering Techniques in Biochemistry
In order to understand the biological role of different bio-molecules, it is necessary to determine the mesoscopic structure of well-defined systems. Neutron and X-ray scattering are non-invasive, probe-free techniques that have been used extensively in such systems to probe length scales ranging from angstroms to microns, and dynamics occurring over picosecond to millisecond time scales. Recent

developments in the area of biology and biomaterials will be presented, and the underlying concepts of the different scattering techniques used to study them will be discussed in detail. (Prerequisite: BIOC-3581 or CHEM-2310 or equivalent.) (2 lecture hours a week.)

BIOC-8208. Advanced Bioanalytical Topics
(Prerequisite: BIOC-3100, or equivalent.) (2 lecture hours a week.)

BIOC-8260. Analytical Toxicology
Analysis of drugs and other toxic substances in biological fluids. The metabolism of drugs as well as the symptomology of poisoning of common therapeutic drugs and the more common industrial chemicals will be discussed. (Prerequisites: BIOC-3100 and BIOC-3110, or consent of instructor.) (2 lecture hours a week.)

BIOC-8404. Computational Enzymology
Computational enzymology is the study of all enzyme-related aspects using computers. It is a powerful and insightful approach for investigating and elucidating the properties, behaviours, and mechanisms of enzymes as well as related aspects such as protein-protein and protein-drug interactions. For instance, it includes mining databases to identify potential ligands (drugs), molecular dynamics (MD) simulations to examine the dynamic behaviour of enzymes including ligand binding, and quantum mechanics/molecular mechanics (QM/MM) methods to elucidate their catalytic mechanisms. In this course we will discuss and learn about these and other approaches of computational enzymology. In particular, we will examine and learn how such methods and approaches can be applied, often complementarily, to understand a desired aspect of the biological chemistry, role(s), and/or properties of enzymes (3 lecture hours a week).

BIOC-8408. Special Topics in Theoretical Chemistry
Topics to be selected by registrants but will generally be molecular orbital calculations for organic and inorganic chemists. (2 lecture hours a week.)

BIOC-8580. The Human Subject: Animal-Free Methods in Biomedical Research and Toxicology
The future of biomedical research and chemical safety testing is human-centred. In line with emerging global trends, this course exposes students to key concepts and methodologies in alternatives to animal testing. From genomics to whole body physiology and systems biology to personalized medicine and computational toxicology, the course offers a comprehensive overview of human biology-based platforms for disease modeling and toxicology. Content will be complemented by case studies in biomedical research and chemical safety testing from academic, industry, and government experts. (Prerequisites: enrolment in a graduate program or permission of the instructor). (3 lecture hours per week). (May be offered as a cross-career course with BIOC-4580).

BIOC-8640. Advanced DNA Science
An advanced lecture and seminar course dealing with DNA science. The lectures cover the biochemistry of DNA and RNA at the molecular levels, the current research topics and their implications for the future research. The course also contains a seminar component in which a number of selected topics will be discussed and presented by and among participants. (Prerequisites: consent of instructor.) (2 lecture hours a week.)

BIOC-8684: Cell death, diseases, and Natural Health Products
This course will cover a detailed biochemical study of physiological (apoptosis and autophagy) and pathological (necrotic) cell death in mammalian systems, and how these cellular processes play important role during the development of various diseases, including viral infection, cardiovascular diseases, neurodegenerative disorders and cancers. It will also present and discuss various preventative

and therapeutic developments and practices using natural health products and purified natural compounds that specifically target biochemical pathways of cell death.(3 lecture hours per week).

CHEMISTRY (CHEM-)

CHEM-8008. Directed Special Studies
A special course of studies with content and direction approved by the student's research advisor and supervisory committee. Although there may be no formal lecture requirements, the course will be equivalent to three one-hour lectures a week for one term. The student will be required (a) to produce a critical review which will be assessed by his or her supervisory committee; the presentation and standard of the review must be appropriate for publication in a scientific journal; (b) to spend one term working in an agreed industrial setting; the quality of work will be assessed by the supervisory committee. This work may be related to but not part of the research undertaken in CHEM-8970 or CHEM-9980. (Prerequisite: approval of the Program Committee.) (The course cannot be repeated for credit under (a) above. Under normal circumstances, M.Sc. students may take this course only once; PhD. students may register under (b) above for two terms of this industrial experience.)

CHEM-8208. Special Topics in Analytical Chemistry
(Prerequisite: CHEM-3210.) (2 lecture hours a week.) (May be offered as a cross-career course with CHEM-4660).

CHEM-8308. Special Topics in Organic Chemistry
Topics may include polymer chemistry, natural product chemistry, physical organic chemistry, or design and execution of organic syntheses. (Prerequisite: CHEM-3310 or consent of instructor.) (2 lecture hours a week.) (May be offered as a cross-career course with CHEM-4308).

CHEM-8318. Current Topics in Organic Chemistry
Topics to be arranged by the instructor, based primarily upon new developments in the field as illustrated by the current research interests of the faculty, as well as by a study of the current literature. (Prerequisites: CHEM-3310 or consent of instructor.) (2 lecture hours a week.)

CHEM-8320. Dyes and Pigments - Design, Synthesis, and Properties
This course describes essential design criteria for organic dyes and pigments and common synthetic strategies for their preparation. Also covered are basic structure-property relations regarding their absorption and emission properties. This is an advanced organic chemistry course and requires a good understanding of intermediate organic chemistry and spectroscopic techniques. Prerequisite: Consent of instructor. (May be offered as a cross-career course with CHEM-4320)

CHEM-8328. Advanced Topics in Organic Chemistry
Special topics in organic chemistry will be described. Some of these may include natural product chemistry, organometallic chemistry or heterocyclic chemistry. (Prerequisite: consent of instructor.) (2 lecture hours a week.)

CHEM-8330. Synthetic Methods in Organic Chemistry
A study of some important organic reactions with emphasis on their practical application in synthesis. (Prerequisites: CHEM-3300 and CHEM-3310, or consent of instructor.) (2 lecture hours a week.)

CHEM-8338. Advanced Topics in Organic Syntheses
The design, execution, and methodology of total syntheses of complex molecules will be discussed. Emphasis will be placed on both retrosynthetic pathways and execution. (Prerequisites: CHEM-3300 and CHEM-3310, or consent of instructor.) (2 lecture hours a week.)

CHEM-8350. Advanced Organic Chemistry
Physical organic chemistry. Includes molecular orbital theory, stereochemistry, thermodynamics, and reaction mechanisms. (Prerequisite: consent of instructor.) (2 lecture hours a week.) (May be offered as a cross-career course with CHEM-4350)

CHEM-8410. Statistical Thermodynamics
A detailed picture of the current status of advanced experimental and theoretical research in modern reaction dynamics. Subjects to be discussed include transition state spectroscopy, coincidence imaging techniques, ion imaging applied to the study of chemical dynamics, nonlinear reaction dynamics in both stirred and reaction-diffusion media, theoretical dynamics treatment of chemical reactions. (2 lecture hours a week.) (May be offered as a cross-career course with CHEM-4410.)

CHEM-8420. Nuclear Magnetic Resonance Spectroscopy
Theory and applications of Nuclear Magnetic Resonance (NMR) in chemical problems, including the origin of the NMR phenomenon, Fourier transforms and spectral processing, spectrometer hardware, pulse sequences, NMR interactions, relaxation and chemical exchange, double-resonance experiments and two-dimensional NMR. (2 lecture hours a week).

CHEM-8458. Special Topics in Physical Chemistry
(2 lecture hours a week.) (May be offered as a cross-career course with CHEM-4450.)

CHEM-8468. Advanced Topics in Spectroscopy
Electronic and vibrational spectroscopy of gases, liquids, and solids. Theory and practice of infrared and Raman spectroscopy. Theory and applications of electron spin resonance spectroscopy. (2 lecture hours a week.)

CHEM-8470. Advanced Quantum Chemistry
Perturbation and variation theories. Theories of many electron atoms and general theories of chemical bonds in diatomic and polyatomic molecules. (Prerequisite: consent of instructor.) (3 lecture hours a week.)

CHEM-8500. Organometallic Chemistry
A detailed study of selected advanced topics in organometallic chemistry. Typical subjects include (at the discretion of the instructors) main group organometallic chemistry; thermochemical methods in organometallic chemistry; catalysis by organometallics; detailed structural studies. (2 or 3 lecture hours a week.)

CHEM-8508. Special Topics in Inorganic Chemistry
A variety of subjects in inorganic chemistry are covered at the discretion of the instructor. The subjects covered may include main group chemistry, transition metal chemistry, organometallic chemistry, inorganic materials, and group theory. (3 lecture hours a week.)

CHEM-8518. Selected Topics in Inorganic Chemistry
The chemistry and properties of inorganic materials. Typical topics include: methods of synthesis, methods of characterization, and applications of inorganic materials. (2 lecture hours a week.)

CHEM-8520. Free Radicals in Chemistry and Biology
This is an advanced level course that covers the principle of radical generation and stabilization, and the foundations of Electron Paramagnetic Resonance (EPR) spectroscopy for studying and characterizing free radicals. Experimental data, such as EPR spectra, will be used to probe the electronic structure of

free radicals as well as provide local information on the coordination geometry for metal complexes including metallo-enzymes. A range of free radical reaction mechanisms will be surveyed, incorporating radical recombination reactions, radical abstraction reactions, radical addition reactions and radical rearrangements. These will be exemplified by important chemical processes as well as examples drawn from biology including lipid peroxidation, lignin synthesis and metallo-enzyme chemistry. (May be offered as a cross-career course with CHEM-4520).

CHEM-8528. Supramolecular Chemistry
Supramolecular chemistry can be defined as the study of chemical systems involving aggregates of molecules or ions held together by non-covalent interactions. This course will survey the concepts, major research areas and applications of modern supramolecular chemistry including intermolecular interactions, molecular recognition, supramolecular devices, self-assembly, supramolecular materials, molecular topology, biomimetic systems and molecular machines. (2 lecture hours a week.) (Cross listed with CHEM-4528)

CHEM-8530. X-ray Crystallography
Theoretical and experimental aspects of single crystal X-ray diffraction methods for the determination of molecular structures. (2 lecture hours a week.)

CHEM-8535. Organometallics for Clean Energy Conversion
This course exposes students to the use of organometallic chemistry for clean energy conversion. The content will be broken up into four major sub-sections regarding Earth's hydrogen, carbon, nitrogen, and oxygen cycles. Topics of interest will include (but are not limited to): i) assessing the energy challenge; ii) nuclear energy; iii) hydrogen as an energy carrier in fuel cells; iv) recent developments in CO_2 hydrogenation; v) assessing global need for ammonia formation and utilization; and vi) homogeneous water oxidation. In each of these areas, students are expected to develop an understanding of the factors that govern chemical reactivity in an effort to propose new catalysts from scratch. Emphasis will be placed on honing students' writing skills, mastering careful literature evaluation, and providing strong oral presentations. (3 lecture hours/week.) (May be offered as a cross-career course with CHEM-4535)

CHEM-8538. Advanced Topics in Organometallic Chemistry
Topics to be arranged by the instructor, based primarily upon new developments in the field as illustrated by the current research interests of the faculty, as well as by a study of the current literature. (2 lecture hours a week.)

CHEM-8599. Applications of Inorganic Spectroscopy
The field of Inorganic Chemistry has relied on spectroscopy to gain insight into the structure and dynamics of species from small molecules to the active sites of metalloenzymes. The objective of this course is to learn different spectroscopic techniques that can be used in combination to identify and characterize inorganic compounds. This course will focus on three techniques with vastly different energies, spectroscopic timescales and resolution: NMR, EPR, and Mössbauer spectroscopy. All these spectroscopies have the influence of nuclear spin states in common, and are among the most informative available for the study of molecules. The course is aimed to be practical, with an emphasis on problem solving, so that it may aid you in your own research endeavours. (3 lecture hours a week.) (May be offered as a cross-career course with CHEM-4599)

CHEM-8600. Surface Chemistry and Analysis
This course covers the formation, characterization and applications of self-assembled monolayers. It introduces students to the process of molecular self-assembly, the preparation of self-assembled monolayers, and the experimental techniques used for their characterization. The first half of the course focuses on these fundamentals. The second half of the course addresses the numerous applications of

self-assembled monolayers. (3 lecture hours/week). (Prerequisite: CHEM-8820 Introduction to Materials Chemistry, or CHEM-3710 Introduction to Materials Chemistry) (May be offered as a cross-career course with CHEM-4600).

CHEM-8608. Advanced Topics in Organic Materials Chemistry
Synthetic approaches as well as physical properties of organic materials such as conducting structures, liquid crystals, dyes, and light emitters are covered. An in-depth understanding of structure-property relationships is the main goal.

CHEM-8630. Self-Organization by Molecular Design
Self-organization is a ubiquitous phenomenon in nature (e.g., cell membranes, vesicles, and iridescent surfaces) and technology (e.g., block-copolymers, liquid crystals, and surfactants). This course will provide a basic understanding of the driving forces for self-organization and how the formation of specific self-organized structures (e.g., layers, micelles, tubes, columns, and cubic arrangements) can be programmed into molecules by rational design. The course will also provide an introduction to variable temperature polarized optical microscopy, thermal analysis (DSC and TGA), and variable temperature powder X-ray diffraction as important characterization techniques for these materials. (2 lecture hours/week and 1 lab/tutorial hour/week). (May be offered as a cross-career course with CHEM-4630).

CHEM-8640. Organic Nanomaterials
This course examines the fundamental concepts, preparation strategies and properties of organic/carbon-rich nanomaterials at the nanoscale, and their applications in various areas of modern chemistry (materials, electronics, pharmaceutical, medicine, etc.). A special emphasis is also put on methods and techniques utilized in materials science to characterize organic nanostructures. (Prerequisite for students in graduate course: CHEM-3310 and CHEM-3700) (May be offered as a cross-career course with CHEM-4640)

CHEM-8641. Bio- and Sustainable Materials
As technology makes increasing inroads into the chemical sciences, the development of new functional sustainable and biomaterials becomes increasingly important. This course focuses on the chemistry, characterization and applications of renewable and degradable polymers as well as on the chemistry of carbohydrates and amino acids, and the properties of their polymers. (3 lecture hours/week.) (May be offered as a cross-career course with CHEM-4641).

CHEM-8650. Membrane Biochemistry
The structure and function of artificial and natural membranes. Special consideration will be given to the identification and function of membrane proteins. (Prerequisites: BIOC-3100 and BIOC-3110, or equivalent.) (2 lecture hours a week.) (May be offered as a cross-career course with BIOC-4020)

CHEM-8660. Analytical Spectroscopy of Surfaces
Surface spectroscopic techniques and their application to the analysis of chemisorbed and physisorbed species and monomolecular layers. (Prerequisite: CHEM-3210 or equivalent.) (2 lecture hours a week.)

CHEM-8820. Introduction to Materials Chemistry
An introduction to topics in materials science and solid-state chemistry are discussed with an emphasis on the relationship between the material structure and its physical, optical, and electrical properties. The topics covered include solid-state materials, crystalline materials, amorphous materials, metals, magnetic materials, polymers, semiconductors, microelectronics, and nanomaterials. The use of these materials in applications is discussed (3 lecture hours/week.)

CHEM-8821. Materials Chemistry Laboratory

This course is a laboratory course designed to provide hands-on skills for the synthesis and characterization of materials, and for their processing to fabricate different types of electronic devices. Experiments cover the synthesis of conductive, surface active, and carbon-rich materials and their characterization by spectroscopic and microscopy methods. The experiments also include basic film processing by physical and solution-based techniques, electric characterization of conductive materials and the fabrication of different organic electronic devices such as transistors and sensors. (3 laboratory hours/week.) (Enrolment restricted to MMCE students.) (Prerequisite: MATL-8821)

CHEM-8831. Research Project
Original laboratory research under the direction of one faculty member from Chemistry and Biochemistry and one faculty member from Mechanical, Automotive, and Materials Engineering. Student must present three seminars discussing their research project. (1 lecture, 12 laboratory hours per week over two terms; 6 credit hours.) (Only open to students in Master of Materials Chemistry and Engineering, whose grade average above 80%, and with agreement of faculty members). (Prerequisites: MATL-8820, MATL-8821, CHEM-8820, CHEM-8821).

CHEM-8832. Magnetochemistry
This course covers the requisite theory underpinning the field of magnetic materials. It provides the necessary skills set for students to interact effectively in this sub-discipline with researchers in the fields of physics, materials science and engineering. Knowledge gained from this course provides current state-of-the-art knowledge in conventional magnetic materials (‘hard’ and ‘soft’ magnets and their applications) as well as emerging fields such as low dimensional magnetic materials and single molecule magnets with applications in next-generation quantum computing. (3 lecture hours/week or 2 lecture hours and 1 lab hour per week.) (May be offered as a cross-career course with CHEM-4832.)

CHEM-9900. The Research Proposal
This course focuses on the development and presentation of a research proposal, as well as the cultivation of a wide base of knowledge of the chemical and biochemical literature. Techniques of research proposal composition, with reference to subject area, budgetary considerations, and written and oral presentation techniques will be discussed. The student will be required to develop and defend his or her own research proposal in chemistry and/or biochemistry. The subject of this proposal must not be from the research work undertaken for the PhD. thesis. A written proposal will be submitted to the student's advisory committee and will be followed by an oral presentation and defence of the proposal. The advisory committee will evaluate the originality, the significance, the clarity of the written and oral presentation, and the student's knowledge of the area in the defence. (Prerequisite: registration in the PhD. program. The oral presentation and proposal defence will take place during the term of registration.) (3.0 Credits).

CHEM-8900. Seminar

CHEM-8970. Master's Thesis

CHEM-9980. Doctoral Dissertation

MEDICAL BIOTECHNOLOGY (MMB) COURSES (BIOC-)

BIOC-8700. Human Physiology and Mechanisms of Disease
This course will cover the field of physiology as it relates to the further understanding, diagnostics, treatment, and human disease-mechanisms of disease. The course is taught from a holistic approach

that provides key insights into cellular physiology and associated molecular aspects of biology related to human disease. The course will outline the principles and practice of cell and molecular physiology, pathological pathways, molecular pathogenesis, and molecular mechanisms of disease. It will be followed by investigations and discussion on the practice of molecular medicine and the translational aspects of molecular pathology: molecular diagnostics, molecular assessment, and personalized medicine. Students will be engaged in presentations and discussions of current and future industry trends, medical and research discoveries that are translational by enhancing the identification, diagnosis, and treatment of human diseases. Topics will include: molecular and cellular mechanisms of cancer; inflammation and immunology; cell death and regulation; stem cell and developmental biology; neurobiology; and gene regulation. (Enrolment restricted to MMB students.)

BIOC-8720. Biochemistry and Cell Biology of Lipids and Membranes
This course focuses on the biochemistry and cell biology of lipids and their role in cellular signaling, with a particular emphasis on the experimental basis of current knowledge. Topics covered include lipid biochemistry, membrane biophysics, the biochemistry and metabolism of small molecules such as steroids and leukotrienes, and an integrative assessment of the role of lipids and membranes in cellular processes such as protein trafficking and intracellular signaling. (Enrolment restricted to MMB students.)

BIOC-8730. Drugs: From Discovery to Market
This course will introduce students to the relevant concepts and applications of organic synthesis and chemical characterization that lead to the discovery and rational design of therapeutic agents. In addition, the course will cover the fundamentals of the clinical trials process and best regulatory practise's in pharmaceutical industries. (Enrolment restricted to MMB students.)

BIOC-8740. Protein Structure and Function
This course will review and examine the principles of protein structure and how it applies to protein function. Moreover, how protein function is controlled and functional genomics will also be considered. Methodologies used in protein structure determination including mass spectrometry and its applications will also be highlighted. The laboratory section of the course will focus on web based computational programs as they apply to protein structure and function. (Enrolment restricted to MMB students.)

BIOC-8750. Strategic Management of Biotech Innovations
The course will provide an overview of the principles underlying the strategic management of innovation with a focus on the biotechnology sector. Topics will include: (i) Sources, types and patterns of innovation (ii) Timing of entry and approaches to improve timing options, (iii) Budget allocation for sustainable RandD projects, (iv) Collaboration strategies, (v) Ways to protect innovations, (vi) Managing new product development teams and (vii) Strategic launching of new products. The course will emphasize concepts and strategies necessary to the development of managerial skills and the appropriate knowledge to identify, evaluate, and manage new biotechnology-based innovations. (Enrolment restricted to MMB students.)

BIOC-8760. Clinical Biochemistry
Clinical Biochemistry is concerned with the analysis and testing of bodily fluids and tissues. This field is fundamental to patient care and contributes significantly to the diagnosis, treatment, monitoring and prognosis of disease processes. This course is designed to introduce students to the field by covering areas including quality control in clinical testing, automation, clinical enzymology and biomarker discovery. In addition, the course will focus on the design, testing and commercialization of specific clinical tests for: liver function, abnormalities in lipid metabolism, diabetes and related metabolic disorders, fertility, reroduction, cancer and therapeutic drug monitoring. Upon completion of the course the students will get a broad exposure of the current state of the technology for the analysis of clinical

samples as well as learning the basic principles in design and testing of clinical assays for a wide range of analytes. (Enrolment restricted to MMB students.)

BIOC-8780. Biotechnology Entrepreneurship
Entrepreneurship in Biotechnology will provide students an introduction to the complexities and unique problems facing the biotechnology industry. Students will be exposed to the topics most critical for successfully founding, financing and operating a life science company, and will be expected to perform many of the same tasks that founders would normally undertake. Discussions with life-science entrepreneurs, evaluation of existing biotechnology firms, case studies based on recent companies and hands-on work developing entrepreneurial endeavors all will be utilized. (Enrolment restricted to MMB students.)

BIOC-8790. Biotechnology Laboratory
This intensive laboratory course will primarily simulate the discovery and rapid characterization of genes and gene products (i.e. proteins). Laboratory experiments will include cutting edge biotechnology techniques and traditional biochemical methodology. Students will be introduced to techniques including nucleic acid isolation and amplification (i.e. PCR), regulation of gene expression, cloning, protein isolation and purification, enzyme functional assays and characterization (2-D electrophoresis, mass spectrometry). (Enrolment restricted to MMB students.)

CHEMISTRY AND MATERIALS ENGINEERING (MMCE) COURSES (Joint program with Engineering) (MMCE-)

MMCE-8820. Introduction to Materials Engineering and Chemistry
This two-term introductory course provides the foundational knowledge of materials engineering and chemistry required for further study in the MMCE program. It covers the mechanical, optical, and electronic properties of a wide range of materials and their preparation methods. Emphasised is the interconnectivity between structures of materials at atomic, molecular, and supramolecular length scales and their application specific properties. The types of materials covered may include metals, alloys, ceramics, magnetic materials, polymers, composites, inorganic semiconductors, organic semiconductors, and nanomaterials. (3 lecture hours/week; 6-credit course over 2 terms.)(Co-requisites: MATL-8821 Materials Engineering and Chemistry Laboratory) (This course is offered only to students enrolled in the Master of Materials Chemistry and Engineering)

MMCE-8821. Materials Engineering Laboratory/Materials Chemistry Laboratory
The laboratory is designed to familiarize students with the use of materials testing and characterization equipment commonly found in industrial and research laboratories. This laboratory will provide hands-on skills for the synthesis of conductive, surface active, and carbon-rich materials. It will also provide hands-on skills on the characterization of materials optoelectronic and thermomechanical properties by spectroscopic and microscopy methods, including optical metallographic microscopy (OM), X-ray diffractometry (XRD), scanning electron microscopy (SEM) and energy dispersive x-ray spectroscopy (EDS). The experiments will also include basic film processing by physical and solution-based techniques (such as spin coating and printing), electrical characterization of conductive materials and the fabrication of different organic electronic devices such as transistors and sensors. (Equivalent to 2 courses over 2 semesters) (Co-requisite: MATL-8820 Materials Engineering and Chemistry Course) (This course is offered only to students enrolled in the Master of Materials Chemistry and Engineering)

MMCE-8905. Advance Seminar in Materials Chemistry and Engineering
This mandatory seminar course focuses on the intersection of materials chemistry and engineering in cutting edge research and development for industrial and commercial applications. A series of seminar presentations will be delivered by invited guest speakers from both academia and industry across North America to address current and emerging topics such as environmental footprints, green synthesis, and life-cycle analysis. While providing and enhancing students' skills in communication, technical, and leadership appropriately to each progressing semester, the seminar series are aimed to raise student's awareness of the innovation and the interrelationship between chemistry and engineering, both as disciplines and professions. A passing grade requires participation in at least three out of four of the seminars that are offered in each of the four semesters (equivalent to 1 course over 4 semesters). (This course is offered only to students enrolled in the Master of Materials Chemistry and Engineering)

COMPUTER SCIENCE

PROGRAMS

Master of Applied Computing (MAC)

The Master of Applied Computing is a professional program that will provide students with a solid foundation and knowledge of industry-oriented practical aspects of Computer Science, which will enable them to take up positions in the growing software industry in Canada and around the world.

Admission Requirements
In order to be admitted to the program, a student must hold a 4-year bachelor degree in Computer Science or related discipline with a minimum major average of 70% or an average of 77% or better in the last 2 years of study. Applicants are required to include a 'statement of interest' (maximum 2 pages) with their application that includes a description of a major technology project they have undertaken in the past 3 years.

Students with a 4-year bachelor's degree in other non-Computer Science disciplines will be eligible for admission if they are accepted into and complete the University of Windsor's one-year Bachelor of Computer Science for University Graduates program with a 70% average or better.

Applicants are strongly encouraged to have a demonstrated background in computer science and mathematical foundations, advanced programming, hardware architecture and systems concepts. Admission is highly competitive, and preference will be given to applicants who exceed the minimum requirements and who have demonstrated work experience in the field. Candidates who lack the recommended background may be considered for admission on a case-by-case basis.

Candidates must demonstrate English proficiency by meeting or exceeding an IELTS score of 6.5 (or equivalent). If an applicant receives an IELTS English language proficiency score of less than 6.5 (or equivalent) they may be offered a conditional letter of acceptance pending successful completion of an approved English Language Training program, such as the University of Windsor's Centre for English Language Development's English Language Improvement Program (ELIP).

International applicants to graduate programs in Computer Science must demonstrate English proficiency by meeting or exceeding an IELTS overall score of 6.5 (or equivalent), with no more than one band scores of 6.0, and no band score below 6.0 (or TOEFL of 92).

Degree Requirements

Total courses: 30 credit hours (10 courses - 3.0 credit hours each)

(a) Take the following 8 courses:
COMP-8117. Advanced Software Engineering Topics
COMP-8157. Advanced Database Topics
COMP-8347. Internet Applications and Distributed Systems
COMP-8547. Advanced Computing Concepts
COMP-8567. Advanced Systems Programming
COMP-8677. Networking and Data Security

COMP-8967. Internship/Project I
COMP-8977. Internship/Project II

NOTE: The above courses, except COMP-8967 and COMP-8977, may be offered in an accelerated 4 or 6 week format.

(b) Two of the following:
BSMM-8120. Finance in a Global Perspective
BSMM-8140. Marketing
BSMM-8130. Managing for Organizational Effectiveness
COMP-8XXX. Any graduate level lecture course offered by the School of Computer Science, excluding COMP-8100 (Literature Review and Survey) and COMP-8900 (Directed Special Studies).
COMP-4XX0. Any 4th year undergraduate-level lecture courses offered by the School of Computer Science, excluding COMP-4960, COMP-4970, COMP-4980, and COMP-4990.
ESCI-8818. Special Topics

Stream: students may specialize in Artificial Intelligence, if they successfully complete two courses from the following list:

COMP-8790. Topics in Applied Artificial Intelligence
COMP-8510. Visual Processing
COMP-8590. Statistical Learning
COMP-8610. Neural Networks and Deep Learning
COMP-8700. Introduction to Artificial Intelligence
COMP-8740. Foundations of Machine Learning
COMP-8720. Topics in Artificial Intelligence
COMP-8730. Natural Language Processing and Understanding
COMP-8750. Knowledge Representation and Reasoning
COMP-8760. Advanced Search Methods

And, (2) they successfully complete their COMP-8977 project/internship course to be on an approved topic in Artificial Intelligence. For these students, a special annotation will be made on their transcripts, stating that they were in the Artificial Intelligence stream

Suggested Program Sequencing

Term 1:
COMP-8117. Advanced Software Engineering Topics
COMP-8547. Advanced Computing Concepts

One of the following four:
BSMM-8120. Finance in a Global Perspective,
BSMM-8130. Managing for Organizational Effectiveness
BSMM-8140. Marketing,
ESCI-8818. Special Topics
COMP-8XXX. Any graduate level lecture course offered by the School of Computer Science, excluding COMP-8100 Literature Review and Survey, COMP-8900 Directed Special Studies.

Term 2:
COMP-8157. Advanced Database Topics
COMP-8567. Advanced Systems Programming

One of the following four:
BSMM-8130. Managing for Organizational Effectiveness
BSMM-8140. Marketing
BSMM-8120. Finance in a Global Perspective,
ESCI-8818. Special Topics
COMP-8XXX. Any graduate level lecture course offered by the School of Computer Science, excluding COMP-8100. Literature Review and Survey and COMP-8900 Directed Special Studies.

Term 3
COMP-8347. Internet Application and Distributed Systems
COMP-8677. Networking and Data Security
COMP-8967. Internship/Project I

Term 4
COMP-8977. Internship/Project II

NOTE: Course sequencing may change (except COMP-8967), particularly for Term 2 and Term 3.

Internship Requirements
Students will be required to complete an approved work-placement internship as part of their COMP-8977 course. Exceptionally, if a student is unable to secure a work-placement with an industry partner, he/she will be assigned an on-campus supervised project. Students will receive credit for the course COMP 8977 (worth 3 credit hours) upon successful completion of their internship. In exceptional circumstances and on a case-by-case basis, the internship could be extended for up to an additional 4-month term, with the permission of the School of Computer Science. In this case, an additional fee will be paid by students to cover the cost of the internship extension.

Master of Science in Computer Science (MSc)

Admission Requirements
Graduates of the University of Windsor or of other recognized colleges or universities may be admitted to programs leading to the Master's degree. A student with minimum 4-year BSc (Honours) degree Computer science or equivalent may be admitted to the program leading to a Master's degree (thesis-based) in Computer Science.

Applicants must have an overall average of at least 70% or equivalent. Their academic preparation should include the core courses or their equivalent that are part of the BSc Honours program of the School of Computer Science. These include Design and Analysis of Algorithms , Operating Systems, Database Systems, Principles of Programming Languages, and Discrete Mathematics.

Strong applicants lacking courses on the topics listed above may be admitted with course conditions as recommended by the admissions committee. Applicants who lack the background preparation are recommended to complete the Bachelor of Computer Science (Honours) degree (the accelerated Bachelor of Computer Science (Honours) for University Graduates is available).

Admitted students will be eligible to participate in the co-op education element of the MSc in Computer. Applications to the co-op education

element are submitted following the successful completion of at least one term of full-time study.

Students eligible to participate in the proposed co-op education will have successfully completed at least one semester of full-time study at the Master's level in the School of Computer Science at the University of Windsor, which includes fulfilling the requirement of attending regular departmental seminars.

For applicants whose native language is not English, see the Senate Policy on Graduate English Language Proficiency Requirement. The Senate on Graduate English Language Proficiency Requirement can be found online on the Central Policies website: www.uwindsor.ca/policies.

The program is extremely competitive. While a limited number of qualified applicants are admitted each year,
meeting the minimum requirements does not guarantee admission.

Degree Requirements

1. The requirements for the degree of Master of Science will be satisfied by pursuing a program of studies consisting of five approved courses and a thesis. (A thesis is a major research project which must involve substantial innovative work generally culminating in original results.)
2. In addition to the above course work, students are expected to attend regular departmental seminars throughout their MSc. studies, as a fulfilment of this requirement.
3. With prior approval of the graduate coordinator, candidates may be permitted to include graduate courses offered by other departments in their program.
4. No student will be allowed to include in his or her program a course which substantially overlaps a course previously taken.
5. All candidates' programs are subject to approval by the Computer Science program graduate committee.
6. Students must maintain a minimum overall average of 70%, and obtain a passing grade in all courses to remain in good standing in the program. A grade of less than 70% in a graduate course will be considered as a failure for that course.
7. A student who fails to maintain the minimum overall average of 70% will be automatically placed on probation in the following term.
8. A student who obtains a grade below 60% in any course will be automatically placed on probation in the following term.
9. A student who fails to achieve satisfactory performance in any aspect of the program (course work, thesis or major paper) may be required to withdraw.

The Master's thesis committee is chosen in the manner described under the section titled, The Program Requirements for the Master's Degree. The final examination will take the form of an open seminar in the presence of the Master's committee. The examination will be open to the public.

Each student must obtain approval of his or her program, in writing, from the graduate coordinator within three weeks of registration. Subsequent changes require written approval from the graduate coordinator.

Co-op Requirements

Recruitment and selection into the co-op element of this program will take place in each of the fall, winter and summer semesters. Admission and pre-employment readiness training will be held in one semester, students will compete for positions in the next semester and complete one eight-month placement (equivalent of two work terms) in the following two semesters.

In addition to the Program Requirements for the Master of Science Degree, students participating in the co-op option must satisfy the following conditions:

1. Have been a full-time student in the Master's program in Computer Science;
2. Have successfully completed a minimum of one study term prior to applying for admission to the co-op stream;
3. Can not be on a leave of absence in the two terms immediately prior to the work terms;
4. Have at least one semester of study remaining upon completion of their work terms in a maximum of three years in the Master's program;
5. Have obtained written permission from the academic supervisor/co-supervisors;
6. Have their placement(s) confirmed by the Centre for Career Education
7. Are not planning to take courses during the work terms.

All Co-op positions must be full-time, paid, related to the degree program and approved by the University. The process of securing a co-op position is competitive. Co-op students will apply for work opportunities as advertised by the Centre for Career Education using an Internet-based software program and employers will make interview and hiring decisions. Students are also encouraged to seek co-op employment outside of the advertised postings by completing a guided job search process facilitated by the Centre for Career Education.

Withdrawal from the co-op program will be granted on an exception basis only as it must be determined that the student has no outstanding commitments to employers. Students who wish to withdraw must meet with a Co-op Coordinator and complete a withdrawal form. However, the only time a student may withdraw from an undergraduate co-op program without further co-op fee payment implications is by the 1st Friday of classes after their first co-op work term. Students who withdraw from Co-operative Education at any other time will be liable for paying the co-op fee for the term in which they are dropping and one additional term. This will help offset the costs of developing another student for placement.

In the interest of building solid partnerships with employers, students who have accepted a co-op employment offer (either by ranking a position in round 1 of the job competition or by accepting a position either verbally or in writing in later rounds) must honour that commitment. Therefore, once students have accepted an offer of employment for a work term, they will be considered registered in the appropriate work term course and must remain in the co-op program until they have completed their work term requirements. Failure to honour these commitments and/or to complete all work term requirements will lead to being required to withdraw from the co-op program and will result in a failing grade on his/her transcript for that work term.

Master of Science in Computer Science (MSc) Artificial Intelligence Stream

In addition to the Program Requirements for the Master of Science Degree programs above (ie, both the MSc-CS-AI and the MSc-CS-AI-Coop), students participating in the AI Stream must satisfy the following conditions:

Degree Requirements

1. Five (5) courses:

(a) One of the Following:

COMP-8590.. Statistical Learning
COMP-8610. Neural Network and Deep Learning
COMP-8740. Foundations of Machine Learning

(b) Two of the Following:
COMP-8590. Statistical Learning
COMP-8610. Neural Network and Deep Learning
COMP-8700. Introduction to Artificial Intelligence
COMP-8720. Topics in Artificial Intelligence
COMP-8730. Natural Language Processing and Understanding
COMP-8740. Foundations of Machine Learning
COMP-8750. Knowledge Representation and Reasoning
COMP-8760. Advanced Search Methods

(c) Two of the Following: COMP-8XX0: Any graduate level course offered by the School of Computer Science, excluding COMP-8010 (Work Term), COMP-8970 (MSc. Thesis) and COMP-9980 (Doctoral Dissertation Research).

Research Thesis:
COMP-8970: A research thesis in an approved Artificial Intelligence topic. A thesis is a major research project which must involve substantial innovative work in Artificial Intelligence, generally, culminating in original results.

Additional Requirements:
Students are expected to attend regular departmental seminars in Artificial Intelligence-related topics throughout their M.Sc. studies, as a fulfilment of this requirement.
With prior approval of the graduate coordinator, candidates may be permitted to include graduate courses in Artificial Intelligence or Artificial Intelligence-related topics offered by other departments in their program.

Students who complete the Artificial Intelligence Stream will have a special annotation on their transcript, stating their Artificial Intelligence specialization.

PhD in Computer Science (PhD)

The general regulations for the Degree of the Doctor of Philosophy (PhD.) at the University of Windsor, as set out in the section titled, The Degree of Doctor of Philosophy, will apply together with the more specific requirements for the degree of PhD. in Computer Science given in the following section. For admission, continuation in good standing, and graduation, students must satisfy both the general university regulations and the specific regulations for Computer Science.

Admission Requirements
Admission to the doctoral program is highly competitive and possession of the minimum requirements does not guarantee acceptance. In order to be considered for admission to the doctoral program in Computer Science, applicants must have completed a master's degree in computer science or a closely related field. Applicants with a degree in other disciplines, such as Information Systems, Computer Engineering, Systems Engineering, Mathematics, Statistics or comparable programs, may be considered for admission at the discretion of the Admissions Committee based on academic background and qualifications. In addition, applicants must demonstrate to the Admissions Committee, the ability to conduct independent research in Computer Science for instance, through the completion of research-

based thesis, research-oriented project, or appropriate research experience in industry or academia.

International applicants to graduate programs in Computer Science must demonstrate English proficiency by meeting or exceeding an IELTS overall score of 6.5 (or equivalent), with no more than one band scores of 6.0, and no band score below 6.0 (or TOEFL of 92 or equivalent).

Program Requirements
All PhD students must fulfill the following graduate academic requirements:
(a) Four graduate courses in Computer Science
(b) Comprehensive examination within six terms after entering the program.
(c) A dissertation proposal within nine terms of entering the program.
(d) Submission of annual progress reports.
(e) Presentation of two seminars, (in additional to the other presentations required herein.
(f) A final examination consisting of a PhD public oral dissertation defence (COMP-9980).

Graduate Courses
Each student must complete four graduate Computer Science courses as follows:
- At the theory/foundational level, at least two courses from the following list: COMP-8400, COMP-8540, COMP-8570, COMP-8590, COMP-8610, COMP-8700, COMP-8720, COMP-8740.
- At the application or topic-specific level, at least two COMP-8xx0 courses excluding COMP-8010, COMP-8970, COMP-9980.

In exceptional cases, and upon approval of the program coordinator, the student may take more than four graduate courses or courses from other programs.
Graduate course selection will be determined by the student's Doctoral Committee. Graduate credit will be given for a grade of 70% or higher in a graduate course.

Comprehensive Examination
The comprehensive examination is one in which the student is asked to demonstrate a reasonable mastery of the field of specialization; it is designed to test the student's command of knowledge and ability to integrate that knowledge, after completion of all or most of the graduate course work. Normally, this examination is completed during the sixth term of graduate study and is a prerequisite to admission to candidacy.

The comprehensive examination will consist of two parts:
(i) the written comprehensive exam in the form of a survey or literature review report as per the standards of ACM Computing Surveys or similar (e.g., Elsevier or IEEE journals), which will be reviewed by the doctoral committee; upon approval, the student will proceed to the oral presentation;
(ii) the oral comprehensive exam in the form of a public presentation evaluated by the doctoral committee.

Admission to Candidacy
A student is admitted to candidacy when the student has passed the qualifying examination, has completed all of the required graduate courses, and has passed the comprehensive examination.

Seminars
The student will complete two seminars: Seminars 1 and 2. Each seminar will consist of delivering a public presentation of research work equivalent to a scientific paper that could be published in a reputable journal or conference or as an impactful research-oriented project in industry. The presentation will take place within the School of Computer Science (as a seminar series, colloquium, or publicly-announced talk), which will require the presence of the supervisor (at least one, if co-supervised) and at least one member of the doctoral committee.

Seminar 1 is normally completed by the eighth term of studies, while Seminar 2 is normally completed by the eleventh term of studies.

Dissertation Proposal
By the ninth term of studies, the student will present, in the form of an oral presentation, an outline of their proposed dissertation research. This will be presented to the doctoral committee who will approve, with or without modifications, or reject the proposal. If the dissertation proposal is rejected, the student will be given a single opportunity to repeat it.

Doctoral Dissertation
The final oral examination of the dissertation requires both an adequate dissertation and a satisfactory defence of the dissertation. This examination will be conducted by the doctoral committee. Following successful completion of Seminar 2, the acceptance and provisional approval of the dissertation by the doctoral committee, and a satisfactory preliminary report from the external examiner, a date for the oral examination can be set. The oral examination will consist of a public presentation evaluated by the committee who will decide on approval, with or without modifications, or rejection. The oral defense is normally completed by the twelfth term of studies.

COMPUTER SCIENCE COURSES (COMP-)

Not all of the courses listed below will necessarily be offered in any one year. A component of certain courses will be offered in conjunction with an advanced undergraduate course; in such cases the undergraduate course work will comprise one half of the graduate course.

All courses are restricted to students enrolled in a Graduate Computer Science program as per specific program requirements, who have all undergraduate qualifying courses and/or have approval from the Computer Science program Graduate Coordinator.

Note: Certain courses listed below require more than one term to complete. Unless such courses are officially graded as "In Progress" (IP), regulations for incomplete grades will apply. See Faculty Regulations - Grading and Dropping Courses.

To remove any suggestion that the word "engineering" in the context of courses in Computer Science may be taken to cover the meaning of "engineering" as used in the context of courses in Professional Engineering, it is hereby acknowledged that Software Engineering is a collection of principles, models, methods, and techniques for the development, maintenance, evolution and reuse of software that meets functional, performance and quality requirements in an economic and competitive manner.

COMP-8010. Work Term
The Work Term is offered on a Pass/Non-Pass basis. It provides the opportunity for students to enhance academic learning with valuable industrial experience, and to develop transferable skills in an applied setting. Students need departmental permission to enrol in the work term, and must have successfully completed a minimum of one-semester full-time study in the graduate program. (Pre-requisite: Departmental permission).

COMP-8100. Literature Review and Survey
The purpose of this course is to prepare students for conducting the specific research on which their thesis will be based. Students are required to complete a thorough literature search on the general area in which they intend to conduct research and to undertake extensive supervised reading. Students must submit a comprehensive survey of relevant research, together with an annotated bibliography and

references of important papers, theses, books, and conference proceedings. The bibliography should include names and current addresses of scientists working in the student's chosen area.

COMP-8110. Advanced Software Engineering
Development and maintenance of software systems that satisfy their specifications. Topics include integrating informal and formal software design methodologies, software reuse, and software reliability.

COMP-8117. Advanced Software Engineering Topics
This course addresses current practices in medium to large-scale software development projects. A comprehensive overview of important design patterns is provided, with emphasis on practical aspects of software analysis and design methodology, implementation techniques and system development paradigms, as well as software testing and verification practices. Strong technical communication and process documentation, including those associated with standard and agile practices, are a particular focus of the course. (This course is restricted to students in the Master of Applied Computing program.)

COMP-8120. Complex Software Systems
This course provides graduate students the opportunity of obtain strong background and skills in developing complex software systems for leadership roles in the tech industry. Topics will address various levels of software systems architecture, and may include parallelism, concurrency, real-time applications.

COMP-8130. Topics in Software Engineering
In this course students will explore and apply select advanced concepts and techniques to the development and enhancement of complex software applications.

COMP-8150. Middleware and Web Engineering
This course introduces software engineering concepts, principles and techniques in middleware and web-based systems. Selected topics include, but are not limited to: architecture design; web modelling in UML; testing techniques in web applications; software monitoring with CORBA interceptors; distributed object systems using CORBA; formal methods in message-oriented middleware.

COMP-8157. Advanced Database Topics
This course will introduce students to advanced topics in database design and information retrieval. Topics covered may include DBMS three-schema level architectures, data models (e.g., relational, object-oriented model), query languages (e.g. Oracle SQL, PL/SQL), file organization and indexing, transaction management, concurrency control, security and recovery procedures, information retrieval on the internet, and other advanced topics (e.g. online analytical processing - OLAP, data warehouses and data mining). This course is restricted to students in the Master of Applied Computing program).

COMP-8207. Emerging Paradigms in Computing Technologies
This course explores the new trending and emerging technologies in the area of Computer Science and Information Technology. Students are required to investigate, through research, reading and use, a number of trending technologies, which reflect the breadth of the computing science discipline. Examples of such trending technologies, which might change over the years, include and is not limited to, cloud computing, cyber security, artificial intelligence and deep learning. For each trending technology, students are required to compare, test and contrast the major available products representing the technology. Each group of students (2 or more students), will be assigned one trending/emerging technology on which they are required to write a critical review report. Students will use a team project management tool for their assigned work and will also present it as seminars to their class, to enhance their communication skills. This course is restricted to students in the Master of Applied Computing program).

COMP-8347. Internet Applications and Distributed Systems
This course will introduce students to the latest tools and technologies for developing internet applications. Topics covered may include a review of client/server model and applications, multi-tier software architecture, content management systems, dynamic server-side applications, principles of parallel programming and distributed systems and techniques for solving complex problems using distributed systems. (This course is restricted to students in the Master of Applied Computing program.)

COMP-8350. Distributed Query Processing
This course will cover topics such as algorithms and techniques for query optimization in distributed databases; methods for evaluating algorithms and experimental procedures. Each student will be required to survey a topic in the area and present a report. Students will also be required to implement algorithms and comparatively evaluate techniques.

COMP-8360. Multimedia Databases
This course focuses on the study of basic and advanced database techniques used to manage multimedia objects in multimedia database systems. Topics covered include: motivation for multimedia databases; fundamental database implementation techniques; characteristics of multimedia applications; multidimensional access structures; image databases; movie databases; further media types such as text and audio; multimedia databases; models and languages; storage techniques; and multimedia presentations.

COMP-8370. Database Management Systems
Current developments in selected aspects of database management. Topics covered may include data models, database languages, database logics, database machines, and transaction management.

COMP-8380. Information Retrieval Systems
Fundamental principles and advanced topics in the design of information retrieval systems. Theoretical as well as practical aspects will be discussed.

COMP-8390. Emerging Non-traditional Database Systems
Course focuses on the study of one or more advanced, new and non-traditional database system(s) like data warehousing and mining, video database systems, mobile database systems, and distributed object-oriented database systems. Topics discussed include system architecture, components, features, implementation, applications and research issues. Both theoretical and practical contributions to further improve the system under study remain part of the course objective.

COMP-8400. Foundations of Programming Languages
Current developments in the theory and practice of programming language design and implementation. Various languages will be considered and may include imperative, applicative, logic, constraint, object-oriented, and equational languages.

COMP-8490. Virtual Reality
This course introduces the fundamental concepts, advanced techniques, and most recent practices of virtual reality research and applications. Topics include: web-based virtual interfaces design, object and behaviour modelling, animation and physical simulation, 3D human-computer interaction, real-time rendering of multi-sensory feedback, and virtual reality tools and applications.

COMP-8500. 3D Animation and Data Visualization
Introduction to visualization methods, especially in the context of 3D modeling and 3D animation; 3D geometric modeling, 3D computer animation; forward/inverse kinematics and rigid body dynamic

techniques for animation. Students will learn interactive modeling/animation tools and their use to produce motion for animations. (May be offered as a cross-career course with COMP-4500).

COMP-8510. Visual Processing
This course introduces fundamental aspects of visual processing. Topics include: image formatting, image processing, image acquisition, camera geometry, camera calibration, feature detection, 3D reconstruction, camera motion computation, feature matching, feature tracking, object recognition and vision for robotics.

COMP-8520. Computer Graphics
Current developments in computer graphics. Topics covered will include hardware, software, interfaces, graphics standards, data structures, rendering algorithms, and visualization.

COMP-8540. Advanced Algorithms
Methodology for developing efficient algorithms. Advanced data structures. Intractable computational problems and approximation algorithms. (May be offered as a cross-career course with COMP-4540).

COMP-8547. Advanced Computing Concepts
This course covers advanced topics in principles and applications of algorithm design and analysis, programming techniques, advanced data structures, languages, compilers and translators, regular expressions, grammars, computing and intractability. Cases studies and applications in current programming languages are explored in class and labs. (This course is restricted to students in the Master of Applied Computing program.)

COMP-8550. Parallel Computation
Introduction to fundamental issues in parallel computation. Basic parallel computing platforms. Models of parallel computation such as shared data and message passing. Data parallel and other abstractions. Cost models and debugging. Programming for performance. Scalability. Workload balancing. Meta-computing in grid environments. Libraries and compilers. Parallel algorithms for numeric and non-numeric problems.

COMP-8560.Parallel Runtime Systems
Introduction to fundamental issues in parallel runtime systems. Thread systems and communication libraries. VSM, I/O and checkpointing. Scheduling and load distribution, synchronization, dynamic memory management, representation. Interface to user and computer architecture. Multiple-strategy systems and configuration. (Prerequisite: BSc Honours Computer Science or permission of instructor.)

COMP-8567. Advanced Systems Programming
This course explores advanced topics in software development techniques for systems programming in the context of the Unix environments for different platforms, ranging from handheld devices to mainframes. Topics include; overview of Unix/Linux and Android operating systems, Shell programming, process control and communication, multi-threading, internet client/server application and service development. This course is restricted to students in the Master of Applied Computing program).

COMP-8570. Computational Geometry and Its Applications
The focus of this course is the design and analysis of algorithms and data structures to solve geometric problems. These problems arise from applied fields such as computer graphics, robotics, pattern recognition, wireless networks, geographic information systems (GIS), and surface modeling. Topics will include: convex hull algorithms, Voronoi diagrams, triangulations, point location, polygons, range searching, line arrangements, and matchings. (Prerequisite: B.Sc. [Hons, Computer Science] or with the permission of the instructor.)

COMP-8580. Topics in Bioinformatics
The purpose of this course is to present a representative sample of computational problems in molecular biology, bioinformatics, genomics and proteomics and efficient algorithms to solve them. Topics may include: molecular biology, sequence alignment, genomics database, protein structure protein interaction, phylogenetic analysis, RNA structure, gene regulation, functional genomics, microarrays. Students will be required to investigate selected problems/methods in computational biology and bioinformatics.

COMP-8590. Statistical Machine Learning
This course introduces the important elements of statistical learning. Statistical learning refers to a set of tools for modelling and understanding complex datasets. It blends Statistics with methods in machine learning, and its main goal is to "learn from the data"; that is: to extract important patterns and trends from the data, and understand "what the data says". Topics include: linear methods for regression, linear methods for classification; resampling methods, model assessment and selection, regularization; non-linear models, basis expansions; tree-based methods; support vector machines, kernel methods; unsupervised learning. Additional topics may include: matrix factorization methods; network-based machine learning; kernel smoothing methods; model inference and averaging; boosting methods; neural networks; prototype methods; ensemble learning; graphical models; high-dimensional problems. The legal, societal and ethical implications of artificial intelligence and machine learning are also discussed.

COMP-8600. Advanced Computer Architecture
Current developments in computer architecture covering advanced concepts in sequential and parallel architectures. Topics include memory hierarchy, homogeneous and heterogeneous architectures, shared-memory (SMP and DSM) and distributed-memory machines (Beowulf cluster to high-end parallel machines), dataflow and multi-threaded architectures, ILP and VLIW, pipelining, and vector machines. Systolic arrays and application/language specific architectures. Networks. Programming models for parallel machines. Programming for performance on different architectures.

COMP-8610. Neural Networks and Deep Learning
This course introduces the fundamentals of neural networks and deep learning. Neural network architectures are discussed along with their associated set of learning algorithms. Topics include: supervised and unsupervised learning, associative learning, competitive learning, probably approximately correct learning, adaptive learning, gradient-descent and optimization. Students will be required to investigate selected shallow and deep learning models of neural networks, including autoencoders; and convolutional, recurrent, recursive, adversarial and probabilistic networks. Applications of deep learning to computer vision, speech recognition, natural language processing, and others. The legal, societal and ethical implications of artificial intelligence and machine learning are also discussed.

COMP-8620.Computational Grid Systems
Introduction to computational grid system goals; issues in requirements acquisition and design, specification and development; computing, networking and institutional infrastructure development; relationship to cluster and super-computing approaches; mechanisms and approaches to account management; grid adaptation of programming model; information service provision and delivery; measurement and analysis of end-to-end performance of parallel and distributed applications; analysis and monitoring tools; issues related to remote access and transparency; resource scheduling and management; and, security issues in authentication, authorization and data integrity. (Prerequisite: BSc Honours Computer Science or permission of instructor.)

COMP-8640.Security and Privacy on the Internet
This course introduces the issues of security in public distributed networks. Topics include: security planning, policies and procedures, threats and strategies, security services and mechanisms, digital rights; topics in Internet related to security and privacy; secure protocols, DES, AES; public key algorithms; VPN; Internet sniffing and scanning tools; intrusion detection, intrusion analysis and tools; viruses and enterprise anti-virus tools; other applications such as digital cash, code signing and anonymous e-mail.

COMP-8670. Advanced Computer Networks
This course will cover developments in modern communication networks. Topics may include: link-level design issues; network routing; network optimization and resource allocation; wireless networks and mobile IP; ATM technology; switching hardware; optical communications; and fault-tolerant networks.

COMP-8677. Networking and Data Security
This course will introduce students to the fundamental concepts of computer networks, with an emphasis on network security. Topics will cover fundamental principles and protocols of computer networks, types of security threats and vulnerabilities and a variety of techniques for addressing security issues, such as security protocols, firewalls, intrusion detection/prevention. (This course is restricted to students in the Master of Applied Computing program.)

COMP-8680. Advanced Internet Systems
This course covers the internet design philosophy and its protocols, such as IPv4, IPv6, TCP and RTP/RTCP. Topics include emerging Internet multimedia services, Quality of Service (QoS), scheduling and policing mechanisms, routing, resource reservation, reliable multicast, flow and congestion control, integrated services, differentiated services, and adaptive applications. (Prerequisite: BSc Honours Computer Science or permission of instructor.)

COMP-8690. Semantic Web
The Semantic Web is an extension of the current world wide web in which information is given well-defined, machine-understandable meaning, thus enabling computers and people to work in cooperation. This course introduces both theoretical and practical aspects in semantic web. Topics will include: languages and representation issues in semantic web; cooperative software agents; web service technology; and information integration theory and practice.

COMP-8700. Introduction to Artificial Intelligence
This course covers fundamental concepts in Artificial Intelligence including problem solving, knowledge representation and reasoning, planning, learning and natural language understanding.

COMP-8720. Topics in Artificial Intelligence
Students will study in depth selected fundamental topics in artificial Intelligence. The focus will be on theories, techniques and algorithms. Topics and contents of this course may differ from term to term depending on the instructor. Students may repeat this course once for credit if the topics are different (maximum two times), with the permission of the School of Computer Science Graduate Coordinator.

COMP-8730. Natural Language Processing and Understanding
This course covers the basic linguistic, logical and AI approaches to the development of natural language understanding systems. Topics covered include: syntactic/parsing strategies, formal semantics, pragmatics and the resolution of various types of ambiguities. Inference strategies involved in the resolution of ambiguities at the pragmatic level include a detailed discussion of the representation of and reasoning with common sense knowledge. The course also includes the implementation of natural

language interfaces and the application of linguistic approaches to the development of intelligent text retrieval systems.

COMP-8740. Foundations of Machine Learning
Students will learn the introduction background and foundation of machine learning. Topics may include: matrix algebra, probability theory, multivariable calculus, information theory, algorithms and complexity, intractability, computational learning theory, optimization, Bayesian learning, linear methods, support vector machines, kernels, dimensionality reduction, matrix decomposition and factorization, clustering, performance evaluation, regression, decision trees, and neural networks. Topics also include legal, societal and ethical implications of machine learning. (This is an experiential course.)

COMP-8750. Knowledge Representation and Reasoning
This course covers advanced topics in knowledge representation and reasoning including Non-monotonic logic, Temporal and spatial representation and reasoning, Probabilistic approaches, Belief and decision networks, and an overview of the applications of these formalisms to diagnosis, navigation and decision making. (Prerequisite: BSc Honours Computer Science or permission of instructor.)

COMP-8760. Advanced Search Methods
This course covers advanced search methods including, for example, gradient-descent family of search methods, hill climbing, simulated annealing, evolutionary search, tabu search, hybrid techniques, adaptive techniques, constraint satisfaction search, forward checking, consistency enforcement and adversarial search (two player games).

COMP-8790. Topics in Applied Artificial Intelligence
Topics in artificial intelligence focussing on intelligent systems and applications. Topics will be selected from areas such as intelligent agents, intelligent tutoring systems, knowledge acquisition, intelligent scheduling, embedded intelligence, constraints satisfaction techniques, and knowledge discovery.

COMP-8880. Advanced Programming Languages
Current developments in the design, application, and implementation of pure lazy functional programming languages.

COMP-8900. Directed Special Studies
With approval of the graduate program coordinator, a student may undertake to write an original paper on a specialized topic which would enhance his or her program of study. The course will involve directed supervised reading and informal discussion with the graduate supervisor. The work undertaken in fulfilling the requirements for this course will not be counted directly for credit in the evaluation of COMP-8970 (M.Sc. Thesis).

COMP-8920. Selected Topics
Selected advanced topics in computer science.

COMP 8967. Internship/Project I
This is the first part of a sequence of two courses, that is, Project 1 and Project 2, to provide supervised experience in completing an approved software project. This course introduces students to project management and prepares them for developing software systems. Students are required to participate in workshops on campus, to work on applied projects under the guidance of a faculty member to improve their technical skills and, are also required to present their projects when completed. (This course is restricted to students in the Master of Applied Computing program).

COMP-8970. MSc. Thesis

A written report, including a thorough review of the literature. The student shall be examined by his or her advisory committee on the content of the thesis and related background knowledge, and shall defend the thesis in a public lecture. In no case may this course be used for credit toward fulfilling the course requirements in the MSc. program. This course is graded on a Satisfactory/Unsatisfactory basis.

COMP 8977. Internship/Project II
This is the second part of a sequence of two courses, that is, Project 1 and Project 2, to provide supervised experience in completing an approved software project. The focus of this course will be on the application of technical knowledge and skills to a specific project and development of other transferable skills. Students may have the opportunity to complete their project in an approved career-related setting. (May be repeated for credit with the permission of the Department Head.) This course is restricted to students in the Master of Applied Computing program).

COMP-8997. Project/Internship
This course will provide supervised experience in completing an approved software project. The focus will be on the application of technical knowledge and skills to a specific project and development of other transferable skills. Students may have the opportunity to complete their project in an approved career-related setting. (6.0 credit course.)

COMP-9980. Doctoral Dissertation Research
An original research investigation, the results of which will be embodied in a concisely written dissertation conforming in style and format to a recognized journal in the field of specification. The dissertation should be of the highest quality possible and suitable for publication. In no case may this course be used for credit toward fulfilling the course requirements in the PhD. program.

ECONOMICS

PROGRAMS

Master of Economics (MA)

Admission Requirements

1. Applicants holding an honours Bachelor's degree in Economics or its equivalent, with at least a major average of 70%, may be admitted to a one-year Master's program. Applicants are expected to have completed one course in each of calculus, linear algebra and statistics. Applicants who have not completed the above mathematics requirements prior to beginning their graduate course work might be accepted for the two-year program.
2. A student with a general degree in Economics, or honours degree in another discipline, with at least a 70% standing, may be admitted to a two-year Master's program.

Two Year MA Program
Students in the two-year MA program are required to take a qualifying year in their first year of the MA program. Selection of courses is to be made in consultation with a graduate advisor. Upon successful completion, students proceed to the remaining requirements.

One Year MA program
Students in the one-year MA program must complete the Major Paper Stream or the Coursework Stream as outlined below:

Major Paper Stream: 7 courses+ major paper (normally to be in in conjunction with one of the courses)
Required Courses:

- At least 1 course in Microeconomics
- At least 1 course in Macroeconomics
- At least 1 course in Econometrics
- 4 Economics courses at the 8XXX level*
- ECON-8960. Major Paper

Coursework Stream: 8 courses (no major paper required)
Required Courses:

- At least 1 course in Microeconomics
- At least 1 course in Macroeconomics
- At least 1 course in Econometrics
- 5 Economics courses at the 8XXX level

***Note for PhD Preparation**
Students intending to pursue a PhD program are advised to take the following courses:
ECON-8010. Microeconomics Theory I
ECON-8020. Macroeconomics Theory I
ECON-8410. Economics Theory I

List of courses that would fulfill the Microeconomics, Macroeconomics and Econometrics requirements (students must take one course from each category)

Microeconomics Courses
ECON-8010. Microeconomics Theory I
ECON-8030. Microeconomic Theory II
ECON-8210. Applied Microeconomics

Macroeconomics Courses:
ECON-8020. Macroeconomics Theory I
ECON-8040. Macroeconomic Theory II
ECON-8220. Applied Macroeconomics

Econometric Courses
ECON-8410. Econometric Theory I
ECON-8420. Econometric Theory II
ECON-8240. Applied Econometrics 1
ECON-8250. Applied Econometrics 2

Master of Applied Economics and Policy (MAEP)

Admission Requirements
In order to be admitted to the program, a student must hold a 4-year bachelor degree with a minimum major average of B- (70%) or an average of B+ (77%) or better in the last 2 years of study. Applicants must have at least one undergraduate course in statistics, and introductory-level courses in microeconomics and macroeconomics. In exceptional cases, students not meeting these requirements can be admitted at the discretion of the Program Coordinator after consultation with the Advisory Board. In addition, two semesters of calculus, and a semester of intermediate microeconomics and macroeconomics are highly recommended, but not required.

Applicants are strongly encouraged to have a demonstrated background in economics and mathematical and statistical foundations. Admission is highly competitive, and preference will be given to applicants who exceed the minimum requirements and who have demonstrated work experience in the field. Candidates who lack the recommended background may be considered for admission on a case-by-case basis.

Candidates must demonstrate English proficiency by meeting or exceeding an IELTS score of 6.5 (or equivalent). If an applicant receives an English language proficiency score of less than 6.5 (or equivalent) they may be offered a conditional letter of acceptance pending successful completion of an approved English Language Training program, such as the University of Windsor's Centre for English Language Development's English Language Improvement Program (ELIP) or submitting a successful English language test score.

Part A (3 courses):
Take all of the following:
ECON 8230: Mathematics for Applied Economics
ECON 8260: Business Communication
ECON 8270: Research Project in Economic Policy and Seminar

Part B (4 courses):
Take four (4) of the following:
ECON 8010: Microeconomic Theory I
ECON 8210: Applied Microeconomics
ECON 8020: Macroeconomic Theory I

ECON 8220: Applied Macroeconomics
ECON 8410: Econometric Theory I
ECON 8240: Applied Econometrics I

Part C (4 courses):
Take 4 additional ECON 8XXX graduate courses not included in Parts A or B except ECON 8960 – Major Paper

Part D (2 courses):
Take any 2 ECON 3XXX or ECON 4XXX courses, except:
ECON-3060 Mathematical Economics I
ECON-4070 Senior Research Workshop
ECON-4950 Economics Internship

ECONOMICS COURSES (ECON-)

All courses listed will not necessarily be offered in every term. Courses are normally three hours a week.

ECON-8010. Microeconomic Theory I
An intensive review of the theory of the firm and consumer theory.

ECON-8020. Macroeconomics Theory I
An intensive review of theories of the determination of aggregate output, employment and price level.

ECON-8030. Microeconomic Theory II
Additional topics in microeconomic theory.

ECON-8040. Macroeconomic Theory II
Additional topics in macroeconomic theory.

ECON-8100. Theory of International Economics
An introduction to the problem of international trade of goods and services, and the related issues of exchange rate determination and balance of payment; Domestic policies under alternative exchange rate regimes; Money and exchange rates in models with sticky or flexible prices.

ECON-8160. Labour Economics I
The demand and supply analysis; human capital; trade unions and collective bargaining; wage structures; labour mobility.

ECON-8310. Industrial Organization
A theoretical and empirical analysis of firms and markets.

ECON-8410. Econometric Theory I
The general linear model, selected single equation problems, and an introduction to simultaneous equations methods.

ECON-8420. Econometric Theory II
Additional topics in econometric theory (Prerequisite: ECON-8410.)

ECON-8430. Applied Econometrics

The specification, estimation, and testing of economic models. Emphasis will be on the classical linear regression model, the implications or violations of its basic assumptions and diagnostic testing. (This course is not intended for students who take ECON-8410.)

ECON-8500. Monetary Theory
A survey of recent developments in the theory of money and monetary control of an economy, in addition to selected topics.

ECON-8800. Models of Strategic Behaviour
A review of game theory showing how strategic reasoning can be used as a tool in decision theory. Topics include solution concepts for Normal form and Extensive form games, plus applications.

ECON-8810. Mathematical Economics
The formal properties of selected economic models. Includes an examination of the problems of existence, uniqueness and stability of solutions.

ECON-8820. Selected Topics in Economic Theory
An examination of the most recent literature on one or two selected topics in theory.

ECON-8900. Regional Economics
Theoretical and policy issues relating to large regions, including, for example, distribution of wealth, distribution of productive resources, and migration.

ECON-8910. Urban Economics
Theoretical and policy issues relating to urban areas, including, for example, urban growth and land use.

ECON-8940. Special Studies in Economics
Research and reading course in a selected field approved by the Department.

ECON-8960. Major Paper

APPLIED ECONOMICS AND POLICY COURSES

ECON-8210. Applied Microeconomics
This course offers a systematic presentation of consumer theory, theory of the firm, and market equilibrium. Topics covered include preferences and utility, exchange, production, pricing, market structures, and welfare economics. These concepts are then applied to various policy issues including price and quantity regulation, taxation of labour and capital, income distribution, and the minimum wage.

ECON-8220. Applied Macroeconomics
This course provides a systematic overview of the theory of aggregate output and employment, the rate of interest, and price level determination. Coverage includes the theories of consumption and investment, the demand and supply of money, inflation, unemployment, and economic growth. These topics are discussed in the context of contemporary empirical work on aggregative relationships. Finally, the theory developed is applied to various policy issues such as a zero-inflation rule, full employment legislation, and a balanced budget amendment.

ECON-8230. Mathematics for Applied Economics
This course focuses on the mathematical methodology to be used in economic analysis. Topics covered include differential calculus and their importance in economics, linear algebra and its applications, optimization, Taylor series and linear approximation. Particular emphasis is placed on learning about

how to use these methods to analyze economic phenomena. ((May be offered as a cross-career course with ECON-3060).

ECON-8240. Applied Econometrics 1
In this course, students will perform applied econometric analysis and use various econometric methods. Topics include probability and sampling, distribution theory, hypothesis testing, estimation, and analysis of variance

ECON-8250. Applied Econometrics 2
This is a continuation of ECON-8240. Students will use statistical methods to analyze economic data, including empirically testing some economic theories and making predictions. Students will perform applied econometric analysis and use advanced econometric methods. (Prerequisite: ECON-8240.)

ECON-8260. Business Communications
Students develop and strengthen their communication skills within a Canadian academic and professional context, building the ability to communicate economic ideas effectively across a variety of relevant formats. The course is designed to enhance students' academic and professional communication abilities, including writing, presentations, and employment-related communication.

ECON-8270. Research Project in Economic Policy and Seminar
This course is intended to develop independent research and presentation skills. With the guidance of the instructor, students will choose a research economic topic, pose a specific question to be addressed and investigate the question. Students will be expected to conduct a formal literature survey which will form the basis for their investigation. The resulting paper can be theoretical, empirical or qualitative in nature. Students will be assessed on the basis of classroom discussions, classroom presentations and written assignment. (Prerequisites: ECON-8210, ECON-8220, ECON-8250.)

MATHEMATICS AND STATISTICS

PROGRAMS

Mathematics and Statistics (MSc)

Admission Requirements:
In addition to the Faculty of Graduate Studies admission requirements, in order to gain admission to the MSc program in Mathematics and Statistics, applicants must have achieved a minimum 70% average or equivalent in mathematics and statistics courses taken in the last two years of undergraduate study.

Mathematics and Statistics (MSc) (Mathematics Field)

The candidate shall successfully complete one of the following courses of study:
(a) seven graduate courses, of which at least four must be numbered with the prefix MATH and the other three must be numbered with the prefix STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor, and a major paper.
(b) six graduate courses, of which at least three must be numbered with the prefix MATH, one numbered with prefix MATH or STAT and the other two must be numbered with the prefix STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor, and a thesis. The originality of a Master's thesis may lie in the organization, presentation, and scholarly evaluation, rather than in the result.

The Department of Mathematics and Statistics requires that students maintain at least a 70% average at all times. Term courses in which a grade of at least 70% has been earned will be accepted for graduate credit. Term courses with a grade lower than 60% will not be accepted for graduate credit. At most two term courses with grades in the 60% - 69.9% range will be accepted for credit subject to the approval of the Faculty of Graduate Studies after a positive recommendation from the Graduate Studies Committee upon consultation with the supervisor. This recommendation will be given on a case-by-case basis.

All course selections require the approval of the student's master’s committee, the supervisor, or the departmental graduate committee.

Mathematics Master's students must attend either 24 seminars or 75 percent of all seminars available during full-time registration, whichever is the smaller number. Seminars include the colloquium series, graduate major paper presentations and thesis presentations.

Master's Committee
If the Thesis option is taken for either the MSc Mathematics and Statistics (Mathematics) or the M.Sc. Mathematics and Statistics (Statistics), a Masters committee must be appointed within the student's first term of study at the Master's II (or M2) (Candidate) level. The Master's committee must be approved by the Executive Committee of the Faculty of Graduate Studies and Research. The Master's committee shall include the student's supervisor as chairperson, one other member of the Department, and one faculty member from outside the Department.

Mathematics and Statistics (MSc) (Statistic Field)

The candidate shall successfully complete one of the following courses of study:

(a) seven graduate courses, of which at least five must be numbered with the prefix STAT and the other two must be numbered with the prefix STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor, and a major paper;
(b) six graduate courses, of which at least four must be numbered with the prefix STAT and the other two must be numbered with the prefix STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor, and a thesis. The originality of a Master's thesis may lie in the organization, presentation, and scholarly evaluation, rather than in the result.

Up to two courses prefixed STAT may be replaced by MATH-8100 and/or MATH-8110.
Statistics Master's students must attend either 24 seminars or 75 percent of all seminars available during full-time registration, whichever is the smaller number. Seminars include the colloquium series, graduate major paper presentations and thesis presentations.

The Department of Mathematics and Statistics requires that students maintain at least a 70% average at all times. Term courses in which a grade of at least 70% has been earned will be accepted for graduate credit. Term courses with a grade lower than 60% will not be accepted for graduate credit. At most two term courses with grades in the 60% - 69.9% range will be accepted for credit subject to the approval of the Faculty of Graduate Studies after a positive recommendation from the Graduate Studies Committee upon consultation with the supervisor. This recommendation will be given on a case-by-case basis.

Master's Committee
If the Thesis option is taken for either the M.Sc. Mathematics and Statistics (Mathematics) or the M.Sc. Mathematics and Statistics (Statistics), a Masters committee must be appointed within the student's first term of study at the II Master's (Candidate) level. The Master's committee must be approved by the Executive Committee of the Faculty of Graduate Studies and Research. The Master's committee shall include the student's supervisor as chairperson, one other member of the Department, and one faculty member from outside the Department.

Master of Actuarial Science (MActSc)

Admission Requirements:
Bachelor's degree in a calculus-based quantitative discipline (e.g. Engineering, physics, chemistry, business) with at least a 70% average (or equivalent) overall and at least 70% in all mathematics and statistics courses in the last two years of undergraduate study. Knowledge of calculus and matrix algebra is essential. Admission is limited and competitive.

Degree Requirements
Total Courses: 12

ACSC-8010. Probability for Risk and Actuarial Science
ACSC-8020. Financial Mathematics, Theory of Interest
ACSC-8030. Derivatives Markets I
ACSC-8040. Derivatives Markets II
ACSC-8050. Life Contingencies I
ACSC-8060. Life Contingencies II
ACSC-8070. Short Term Actuarial Models
ACSC-8100. Microeconomics
ACSC-8110. Macroeconomics
ACSC-8200. Regression and Time Series
ACSC-8300. Mathematical Statistics for Actuarial Science
ACSC-8400. Actuarial Science Capstone Project

The 12 required courses are scheduled over four semesters.

The Department of Mathematics and Statistics requires that students always maintain at least a 70% average. Term courses in which a grade of at least 70% has been earned will be accepted for graduate credit. Term courses with a grade lower than 60% will not be accepted for graduate credit. At most two term courses with grades in the 60% - 69.9% range will be accepted for credit subject to the approval of the Faculty of Graduate Studies after a positive recommendation from the Department's Graduate Studies Committee upon consultation with the Director of the Master of Actuarial Science program. This recommendation will be given on a case-by-case basis.

Mathematics and Statistics (PhD)

Admission Requirements
For admission requirements and period of study, the general regulations of the Faculty of Graduate Studies should be consulted (see the section titled, The Degree of Doctor of Philosophy). In addition to the Faculty of Graduate Studies admission requirements, in order to gain admission to the PhD program in Mathematics and Statistics, applicants must have achieved a minimum 77% average or equivalent in mathematics and statistics courses taken during their Master's degree. Qualifying examinations will not normally be required. Students in a Master's program may apply for fast-track admission to a PhD program according to the Faculty Regulations for the Doctor of Philosophy (recommendations must be made no earlier than term 3 and be approved prior to the completion of term 4 of the Master's degree, and the actual transfer has to happen no later than term 5 of the Master's degree. Student must have completed all graduate courses for the Master's degree and obtained a minimum 80% average). In the Department of Mathematics and Statistics, students will require a written recommendation from their supervisor, completion of at least four (4) graduate-level courses, and a minimum 80% average in those courses. Students must also write and pass the first two comprehensive exams, which will be counted toward the PhD degree requirements. If, on the recommendation of the supervisor, the Graduate Studies

Committee feels that the student is not making progress toward completion of the PhD, or if the student wishes to withdraw from the doctoral program, in exceptional circumstances the student may transfer back to the MSc program and complete the requirements of that degree.

Candidacy
Students will be recommended for candidacy (see section titled, The Degree of Doctor of Philosophy - Admission Requirements) only after successful completion of the Comprehensive Examinations and course work.

Degree Requirements for the PhD (Statistics Field)

1) Course Work: Students admitted with an M.Sc. or equivalent must successfully complete at least four graduate courses numbered with the prefix STAT; further graduate courses may be assigned by the Graduate Studies Committee in consultation with the supervisor. Transfer credits will not be allowed. (Up to two courses prefixed STAT may be replaced by MATH-8100 and/or MATH-8110.)

Students admitted with an Honours B.Sc., or equivalent, which is done only in exceptional cases, must successfully complete at least twelve graduate courses, eight of which must be numbered with the prefix STAT and the other four must either be numbered STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor; further graduate courses may be assigned by the Graduate Studies Committee in consultation with the supervisor. Transfer credits will not be allowed. It is strongly recommended that all PhD. students in Statistics take a measure theoretic probability course.

The Department of Mathematics and Statistics requires that students maintain at least a 70% average at all times. Term courses with a grade lower than 70% will not be accepted for graduate credit.

PhD. students must give a fifty-minute presentation prior to the thesis defence.

2) Doctoral Committee: within the student's first term of study at the doctoral level, a doctoral committee will be appointed by the Head of the Department upon the advice of the Graduate Studies Committee. Refer to the calendar section “Faculty Regulations for the Doctor of Philosophy and the Master's Degrees”.

3) Dissertation: The dissertation shall be defended at an oral examination. Refer to the calendar section “Faculty Regulations for the Doctor of Philosophy and the Master's Degrees”.

4) Comprehensive Examinations: A student must pass a series of three written comprehensive examinations as follows:
i. Paper I: Mathematical Statistics and Probability
ii. Paper II: Statistics or Probability
iii .Paper III: Topics (two topics mutually agreed upon by the supervisor and student).

If a student fails an examination, it may be repeated once, but if the examination is failed a second time, the student must withdraw from the program. These examinations must be successfully completed within twenty-five months of first registration in the doctoral program. If this deadline is not met, the student must withdraw from the program.

5) Statistics Doctoral students must attend either 72 seminars or 75 percent of all seminars available during full-time registration, whichever is the smaller number. Seminars include the colloquium series, graduate major paper presentations and thesis presentations.

Degree Requirements for the PhD (Mathematics Field)

1) Course Work: Students admitted with an M.Sc. or equivalent must successfully complete at least four graduate courses numbered with the prefix MATH; further graduate courses may be assigned by the Graduate Studies Committee in consultation with the supervisor. Transfer credits will not be allowed.

The Department of Mathematics and Statistics requires that students maintain at least a 70% average at all times. Term courses with a grade lower than 70% will not be accepted for graduate credit.

Students admitted with an Honours B.Sc., or equivalent, which is done only in exceptional cases, must successfully complete at least twelve graduate courses, eight of which must be numbered with the prefix MATH and the other four must either be numbered STAT or MATH or be approved by the Graduate Studies Committee upon the recommendation of the supervisor; further graduate courses may be assigned by the Graduate Studies Committee in consultation with the supervisor. Transfer credits will not be allowed.

PhD. students must give a fifty-minute presentation prior to the thesis defence.

2) Doctoral Committee: within the student's first term of study at the doctoral level, a doctoral committee will be appointed by the Head of the Department upon the advice of the Graduate Studies Committer. Refer to the calendar section “Faculty Regulations for the Doctor of Philosophy and the Master's Degrees”.

3) Dissertation: The dissertation shall be defended at an oral examination. Refer to the calendar section “Faculty Regulations for the Doctor of Philosophy and the Master's Degrees”.

4) Comprehensive Examinations: A student must pass a series of three written comprehensive examinations two of which must be chosen from the following areas: Algebra, Analysis and Operational Research. The third exam, which may be written or oral, is in the area of specialization to be set by the student's doctoral supervisor and doctoral committee.

If a student fails an examination, it may be repeated once, but if the examination is failed a second time, the student must withdraw from the program (see section titled, The Degree of Doctor of Philosophy - The Dissertation). These examinations must be successfully completed within twenty-five months of first registration in the doctoral program. If this deadline is not met, the student must withdraw from the program.

5) Mathematics Doctoral students must attend either 72 seminars or 75 percent of all seminars available during fulltime registration, whichever is the smaller number. Seminars include the colloquium series and graduate major paper and thesis presentations.

MATHEMATICS AND STATISTICS COURSES

All courses listed will not necessarily be offered in any given year.

MATH (MATH-)

MATH-8100.Functions of a Real Variable I
Lebesgue measure, abstract measure, integration, monotone and dominated convergence theorems, Radon-Nikodym theorem, Hahn decomposition theorem, Fubini's theorem, Lp spaces. (May be offered as a cross-career course with MATH-4580).

MATH-8110. Functions of a Real Variable II
Metric spaces, topological spaces, compactness, Stone-Weierstrass and Ascoli theorems, Baire category theorem, classical Banach spaces.

MATH-8120. Functional Analysis I
Normed linear spaces and examples, Hahn-Banach theorem, open mapping theorem, principle of uniform boundedness, weak and weak topologies on Banach spaces, Hilbert spaces and bounded linear operators on Hilbert spaces. (May be offered as a cross-career course with MATH-4570).

MATH-8130. Functional Analysis II
Banach algebras and spectral theory, operator theory, C*-algebras and their representations, elementary von Neumann algebra theory.

MATH-8200. Abstract Algebra
Elements of group theory are explored including such topics as: the Sylow Theorems, classification of groups of low order, Jordan-Holder Theorem, solvable groups, nilpotent groups, groups in terms of generators and relation, representations of groups, basic operations on representations, orthogonality relations. (May be offered as a cross-career course with MATH-4220).

MATH-8210.Ring Theory and Modules
This course is designed to introduce students to the structure theory of general rings and their modules. It will provide an appropriate foundation for more advanced graduate material in algebra at the doctoral level and will be an excellent preparation for doctoral comprehensive examinations. Topics covered will include: semi simple rings, Wedderburn-Artin Theorem, modules over a principal ideal domain, projective, injective and flat modules, introduction to homology theory. (May be offered as a cross-career course with MATH-4210).

MATH-8220. Introduction to Field Theory
This course will cover polynomial rings, splitting fields, the fundamental theorem of Galois theory, Galois' criterion for solvability by radicals, algebraically closed fields, and finite fields. (Prerequisites: MATH-2251 and MATH-3200) ((May be offered as a cross-career course with MATH-4230.)

MATH-8230. Lie Algebras
Engel's Theorem, Lie's Theorem, criterion for semi simplicity, root space decomposition, universal enveloping algebra, PBW basis, representation theory, finite dimensional modules, Harish-Chandra's Theorem.

MATH-8250. Matrix Algebra and Analysis
Aspects of measure theory and probability, convergence theorems for integrations and expectations, moments and inequalities, construction of Lebesgue-Stieltjes measure, Riemann-Stieltjes integral,

comparison of Riemann and Lebesgue integrals, introduction to complex variable, contour integration, characteristics functions, elementary theorems on linear and matrix algebra, generalized and conditional inverses, distributions of quadratic forms. This course is designed for graduate students in Statistics.

MATH-8300. General Topology
Elementary concepts of topology, product and quotient spaces, continuity and homeomorphisms, nets and filters, separation and countability, compactness, connectedness. (May be offered as a cross-career course with MATH-4300).

MATH-8510. Advanced Linear Programming
By presenting results and their proofs, the student will acquire a solid understanding of the theory, algorithms and applications of linear programming. This course is a prerequisite for more advanced courses on integer programming, combinatorial optimization and networks flows. Topics emphasized include: formulations of linear programming problems, convex sets and convex functions, separation theorem, Farkas' lemma, duality theory, economic interpretation of duality, optimality conditions, primal and dual simplex algorithms, cycling, sensitivity analysis, interior-point methods and central path, primal-dual methods, convergence results.

MATH-8520.Nonlinear Programming
This course will provide an introduction to the field of nonlinear programming. By presenting results and their proofs, the student will acquire a solid understanding of the theory behind most algorithms for solving nonlinear optimization problems. He/she will also acquire the knowledge and skills needed to conduct research in this area. Topics covered will include: unconstrained optimization, necessary and sufficient conditions for optimality, convex sets and convex functions, steepest descent method, Newton's method, conjugate gradient methods, quasi-Newton's methods, separation theorem and Farkas' lemma, Karush-Kuhn-Tucker conditions, constraint qualification conditions, duality theory, Barrier methods, and quadratic programming.

MATH-8530. Integer Programming
This course will provide the student with a rigorous introduction to the field of integer programming. Topics covered will include: modelling with integer variables, elements of computational complexity theory, elements of polyhedral theory, total unimodularity, branch and bound methods, cutting plane methods, implicit enumeration, Bender decomposition, dynamic programming, lagrangian relaxation, knapsack problems, set covering/packing/partitioning problems, heuristic methods.

MATH-8540. Combinatorial Optimization
This course will provide a rigorous introduction to combinatorial optimization. The student will develop a solid understanding of the theory, algorithms and applications of these problems and their connections to integer programming, linear programming and complexity theory. Topics will include: formulation of combinatorial optimization problems, polytopes and polyhedra, elements of computational complexity theory, shortest paths, bipartite and non-bipartite matchings, max-flow min-cut theorem, multi-commodity flow problems, clique and coloring problems, perfect graphs, traveling salesman problem, spanning trees, matroids.

MATH-8610. Partial Differential Equations
First-order equations, classification of second-order equations, canonical forms and general solutions of second-order equations, diffusion equations, Laplace equations, the maximum principle and uniqueness for the Dirichlet problem, wave equations, Riemann's method for linear hyperbolic equation, Green's functions and transform methods.

MATH-8680. Numerical Analysis I

General error analysis, direct solution of linear algebraic equations, iterative solution of linear equations, algebraic eigenvalue problems, numerical solution of a system of nonlinear equations, error analysis.

MATH-8690. Numerical Analysis II
Interpolation and approximation, numerical integration and differentiation, finite differences. Numerical solution of ordinary and partial differential equations using finite differences.

MATH-8820. Portfolio Optimization
This is a first course on Markowitz mean-variance portfolio optimization. The course will cover quadratic programming, parametric quadratic programming, the efficient frontier, the capital asset pricing model, Sharpe ratios and implied risk-free returns, portfolio optimization with constraints, and quadratic programming solution algorithms; also covered are professional writing and presentation skills and the use of optimization software. (Prerequisite: MATH-2251.) (May be offered as a cross-career course with MATH-4960.)

MATH-8980. Special Topics
(May be offered as a cross-career course with MATH-4000).

MATH-8960. Major Paper

MATH-8970. Master's Thesis (MSc)

MATH-9980. Dissertation (PhD)
Graded as pass/fail.

STATISTICS (STAT-)

STAT-8410. Stochastic Processes
Discrete and continuous time Markov processes, renewal theory, branching processes, Brownian motion.
(May be offered as a cross-career course with STAT-4410).

STAT-8420. Advanced Mathematical Statistics
A review of probability theory, transformations and expectations, common families of distributions, inequalities and identities, properties of a random sample, data reduction and best estimation strategies, asymptotic approximation.

STAT-8430. Statistical Inference
Measure of performance, pure significance test and formal hypothesis testing, interval estimation, asymptotic evaluations, analysis of variance and regression, analysis of categorical data.

STAT-8460. Statistical Data Analysis
This course takes a computer-oriented approach to equip students with the experience of data analysis, beginning with designing of experiment to presentation of results. Depending on the background of the students, different topics will be emphasized. (May be offered as a cross-career course with STAT-4460).

STAT-8470. Survival Analysis
Survivorship and hazard functions and their relationship to lifetime distributions and densities; types of censoring; the Kaplan-Meier and Nelson-Aalen estimators of the survivor and cumulative hazard functions; log rank tests; parametric survival time distributions and related regressions; semi-parametric regression models including the Cox's PH model; regression diagnostics; further topics may include:

counting process approach, recurrent event analysis, time dependent covariates, frailty models, sequential and group sequential techniques and statistical learning algorithm. (May be offered as a cross-career course with STAT-4470).

STAT-8490. Discrete Multivariate Analysis
This course is aimed at giving theoretical and methodological background for the analysis of discrete data mainly in the form of contingency tables. Other discrete models as part of the generalized linear models may be covered. (May be offered as a cross-career course with STAT-4490).

STAT-8500. Generalized Linear Models
This course is aimed at giving theoretical and methodological background for the analysis of discrete or continuous data using the generalized linear models and other semi-parametric models where full distributional assumptions cannot be justified. (May be offered as a cross-career course with STAT-4500).

STAT-8520. Experimental Design
Factorial designs with and without interactions, randomized block, Latin square, balanced incomplete block, nested design, confounding factorial and other designs. Fixed, random and mixed models. (May be offered as cross-career course with STAT-4980).

STAT-8540. Theory of Sampling and Surveys
Sampling methods including simple random, stratified, cluster, PPS and multistage, ratio and regression estimates. Theory and applications. (May be offered as a cross-career course with STAT-4981).

STAT-8550. Regression Analysis
Simple and multiple linear regression, inference on regression parameters, residual analysis, stepwise regression, polynomial regression, diagnostics and remedial measures for multicollinearity and influential observations, weighted least squares, logistic regression, nonlinear regression. (May be offered as a cross-career course with STAT-4550).

STAT-8560. Statistical Consulting
This course is aimed at training students how to: (a) develop problem solving skills in applied statistics; (b) interact with clients from other scientific disciplines who seek statistical consultancy; and (c) improve skills for writing statistical data analysis reports. (May be offered as a cross-career course with STAT-4560).

STAT-8590.Topics in Statistics
Topics offered may include queueing theory, statistical quality control, statistical consulting, survival analysis, time series analysis, decision theory, and Bayesian analysis. (May be offered as a cross-career course with STAT-4000).

STAT-8700. Biostatistics
This course will be focused on the application of statistical methods in life and health sciences. Topics covered will include the formulation of study objectives in statistical hypotheses testing and estimation frameworks, the design of clinical studies, types of data and measurements, data description and visualization, procedures for testing statistical hypotheses, estimation via point estimates and confidence intervals, linear and logistic regression models for clinical data, analysis of event history data such as survival end-points, and the statistical analysis of categorical data. Students will be expected to use a statistical software such as R, SAS, SPSS, or Tableau for data analysis and visualization. This course will also introduce the concepts of Indigenous Data Sovereignty and will include appropriate

examples reflecting indigenous knowledge. (3 lecture hours per week.) (May be offered as a cross-career course with STAT-4700).

STAT-8960. Major Paper

STAT-8970. Thesis (MSc.)

STAT-9980. Dissertation (Phd)
Graded as pass/fail.

ACTUARIAL (ACTU-)

ACSC-8010. Probability for Risk and Actuarial Science
Topics include discrete and continuous probability univariate and multivariate distributions, conditional and marginal distributions. Moments. Generating functions. Transformation of random variables. Order Statistics. Central Limit Theorem. Course is restricted to students in Master of Actuarial Science. (Prerequisite: Integral Calculus.)

ACSC-8020. Theory of Interest
Topics include interest rates, force of interest, equations of value, annuities, amortization, bonds, cash flows, yield, rate of return, term structure, forward interest rates, spot rates, duration, convexity, immunization. (Course is restricted to students in the Master of Actuarial Science program.) (May be offered as a cross-career course with ACSC-3980).

ACSC-8030. Derivatives Markets I
Topics include financial derivatives, short selling, European and American options, hedging, arbitrage, forwards, futures, swaps, bond price models, binomial model, binomial model. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8010, ACSC-8020.) (May be offered as a cross-career course with ACSC-4030).

ACSC-8040. Derivatives Markets II
Topics include Black Scholes option pricing, exotic options, Brownian motion, Ito integrals. Stochastic models. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8030.)

ACSC-8050. Life Contingencies I
Topics include life contingencies, survival distributions and life tables, life annuities, net premiums, premium reserves. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8020.) (May be offered as a cross-career course with ACSC-4980).

ACSC-8060. Life Contingencies II
This course builds on the foundational life contingencies knowledge developed in ACSC-8050 and extends into advanced topics in the field. Topics include advanced life contingencies, risk theory, survival models, construction of mortality tables. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8050.) (May be offered as a cross-career course with ACSC-4981).

ACSC-8070. Short Term Actuarial Models
This course allows students to select and explore in depth relevant topics of interest. Topics selected may include areas such as: loss models (severity models, frequency models, aggregate models, losses, risk measures, empirical models, parametric models, failure time, loss distributions), Bayesian analysis,

simulation, etc. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8010.)

ACSC-8100. Microeconomics
This course provides an introduction to microeconomics, including the tools necessary to begin to understand and evaluate how resources are allocated in a market economy. Specific topics include how markets function, theories of the business firm, of consumer behaviour and of income distribution, supply and demand, the economic roles of labour unions and government. This course is restricted to students in the Master of Actuarial Science program.

ACSC-8110. Macroeconomics
This course provides an introduction to macroeconomics with an emphasis on measuring and explaining economic aggregates such as the GDP and the level of prices and employment. Topics include the role of money and financial institutions, the impact of international trade, the policy options available to governments for coping with inflation and unemployment. This course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8100.)

ACSC-8200. Regression and Time Series
This course introduces regression and time series analyses. Topics include multiple linear regression, least squares, model fitting, estimation, testing, matrix formulation, indicator variables, logistic regression, residual analysis, prediction intervals, times series, autoregressive models, moving average models, ARIMA models, fitting models, estimation and forecasting. Course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC-8010.) (May be offered as a cross-career course with STAT-4200).

ACSC-8300. Mathematical Statistics for Actuarial Science
This course will fulfill the requirements of the Validation by Educational Equivalent (VEE) for Mathematical Statistics of the Society of Actuaries. This calculus-based course will cover random sampling, statistical inference, sampling distributions, estimation, maximum likelihood, confidence intervals for unknown parameters, the Neyman-Pearson lemma, significance and power, likelihood ratio test, contingency tables, and goodness-of-fit. This course is restricted to students in the Master of Actuarial Science program. (Prerequisite: ACSC- 8010.) (3 lecture hours.)

ACSC-8400. Actuarial Science Capstone Project
This course will provide supervised experience in the solution of a realistic actuarial problem by making use of knowledge obtained in the first three terms of the Master of Actuarial Science program. The solution will be effected using spreadsheet software and will be communicated orally using presentation software and in writing using word processing software. (Prerequisite: This course is restricted to students in Term 4 of the Master of Actuarial Science program.)

PHYSICS

PROGRAMS

Master of Science (MSc)

Admission Requirements
A four-year Bachelor's degree with adequate specialization in Physics with a minimum Cumulative Grade Point Average (CGPA) of 75% in the last 2 years of full-time study. Possession of minimum required CGPA does not ensure admission. The actual admitting average varies and is competitive.

International Applicants must submit evidence of English language proficiency with minimum scores as required by the Faculty of Graduate Studies. Some examples of minimum scores are TOEFL: IBT-83, or IELTS: 6.5, or Pearson: 65. A Graduate Record Examination (GRE) Advanced Physics Test score is helpful to the Admissions Committee to evaluate your application more completely.

Degree Requirements
Program M2. Master of Science (MSc)
Students may complete an MSc degree in the Department of Physics by enrolling in one of the following plans:

Thesis Plan
The MSc thesis program plan in Physics is intended for students with an honours B.Sc. degree in Physics or closely allied field who wish to pursue a career in scientific research and development. The program requirements may be completed by taking four graduate semester courses plus a thesis. The M.Sc. thesis is completed under the supervision of a faculty advisor and is evaluated by the M.Sc. thesis committee. The normal duration of the MSc thesis program plan is two years, however, students who wish to transfer into the PhD program may complete the course requirements within one year.

Course requirements:
All physics MSc students in the thesis plan must successfully complete four courses chosen from the available graduate offerings (including PHYS-8000 Seminar for MSc Students) in the Department of Physics. The student may be required to take additional courses, as stipulated by the student's Master's committee.
(1) Students may substitute courses with alternatives from related and cognate programs, with the permission of the Master's Committee, Graduate Coordinator, and the Faculty of Graduate Studies, up to:
(i) one graduate-level course from another department normally from the Faculty of Science or the Faculty of
Engineering
(ii) one cross-career or 4000-level course in physics
(2) PHYS-8000 (Seminar for MSc Students) will be required of all students in the fall and winter terms.
(3) Students in the MSc program must register for PHYS-8970 MSc Thesis in each term before graduation.

Major Paper Plan
The one-year M.Sc. Major Paper program plan in Physics is intended for students with an honours BSc degree in Physics or closely allied field who wish to pursue a career in scientific research and

development. The program requirements may be completed by taking six graduate semester courses plus a Major Paper under the supervision of a faculty advisor.

Course requirements:
All physics MSc students in the major paper plan must successfully complete six courses chosen from the available graduate offerings (including PHYS-8000 Seminar for MSc Students) in the Department of Physics.
(1) Students may substitute courses with alternatives from related and cognate programs, with the permission of the faculty advisor, Graduate Coordinator, and the Faculty of Graduate Studies, up to:
(i) two graduate-level courses from another department normally from the Faculty of Science or the Faculty of
Engineering
(ii) two cross-career or 4000-level courses in physics
(2) PHYS-8000 (Seminar for MSc Students) will be required of all students in the fall and winter term
(3) Students in the MSc major paper plan must register for PHYS-8960 MSc Major Paper in each term before
graduation.

Course Work Plan
The one-year MSc. course-work program plan in Physics is intended for students with an honours B.Sc. degree in Physics or closely allied field who wish to pursue a career outside research. The program requirements may be completed by taking eight graduate courses.

Course requirements:
All physics MSc students in the course work plan must successfully complete eight courses chosen from the available graduate offerings (including PHYS-8000 Seminar for MSc Students) in the Department of Physics.
(1) Students may substitute courses with alternatives from related and cognate programs, with the permission of the Graduate Coordinator and the Faculty of Graduate Studies, up to:
(i) two graduate-level courses from another department normally from the Faculty of Science or the Faculty of
Engineering
(ii) two cross-career or 4000-level courses in physics
(2) PHYS-8000 (Seminar for MSc Students) will be required of all students in the fall and winter terms.
(3) Students will not receive credit for PHYS-8970 MSc Thesis or PHYS-8960 MSc Major Paper

Minimum Grade Required for Graduate Credit
Courses in which a grade of 70% or higher is received will be accepted for graduate credit. Students must obtain a grade of 70% or higher in all courses.

Policy on Grades below 70%
In rare cases of extenuating circumstances, where in spite of the accommodation provided a grade of 60-69% was obtained, the Department may recommend to the Faculty of Graduate Studies to grant graduate credit for this course. Only one such course where a grade of 60-69% was earned can receive graduate credit.

Master's Thesis/Major Paper Committees
An advisory committee consisting of the research advisor and at least one other faculty member in Physics will periodically review the student's progress. The Master's Thesis/Major Paper Committee must be requested by the student, and approved by the Faculty of Graduate Studies prior to the second term of registration in the MSc program.

Each MSc candidate in the Thesis plan will, on recommendation of the advisory committee, submit to a final oral examination in defence of the thesis. For the defence of the thesis, the committee will be supplemented by one faculty member from outside Physics who will be present at the final oral examination.

Master's Thesis/Major Paper Committees
An advisory committee consisting of the research advisor and at least one other faculty member in Physics will periodically review the student's progress. The Master's Thesis/Major Paper Committee must be requested by the student, and approved by the Faculty of Graduate Studies prior to the second term of registration in the MSc program.

Each MSc candidate in the Thesis plan will, on recommendation of the advisory committee, submit to a final oral examination in defence of the thesis. For the defence of the thesis, the committee will be supplemented by one faculty member from outside Physics who will be present at the final oral examination.

Program M1. Master of Science Qualifying Year
Students who have insufficient prerequisite coursework in Physics may be admitted to the M1 Master's qualifying year. The following undergraduate courses must be completed as part of the M1 year with a minimum mark of 70% in each course:

FALL
PHYS-3115. Atomic and Molecular Spectra
PHYS-3200. Electromagnetic Theory
PHYS-3500. Classical Mechanics

Winter
PHYS-4100. Quantum Mechanics I
PHYS-3210. Electromagnetic Waves
PHYS-4130. Introduction to Statistical Mechanics

Students who successfully complete these six courses with a minimum mark of 70% in each course will advance to the M2 MSc coursework year. If an advisor agrees to supervise the student, an M1 student may advance to the M2 MSc thesis or major paper plan. No graduate courses or undergraduate/graduate cross-career courses may be taken in this year.

Doctor of Philosophy (PhD)

Admission Requirements
Students may apply to the PhD program either with a Master's degree, or request to transfer after a year of excellent performance in the M.Sc. thesis program.

An applicant with a Master's degree must have adequate specialization in Physics with a minimum Cumulative Grade Point Average (CGPA) of 75% in the last 2 years of full-time study including all graduate courses.

Exceptionally qualified undergraduates may be directly admitted into the PhD. program. A four-year Bachelor's degree with adequate specialization in Physics with a minimum Cumulative Grade Point Average (CGPA) of 77%, and a minimum Cumulative Grade Point Average (CGPA) of 80% in the last 2 years of full-time study is required.

Possession of minimum required CGPA does not ensure admission. The actual admitting average varies and is competitive.

International Applicants must submit evidence of English language proficiency with minimum scores as required by the Faculty of Graduate Studies. Some examples of minimum scores are TOEFL: IBT-83, or IELTS: 6.5, or Pearson: 65. A Graduate Record Examination (GRE) Advanced Physics Test score is helpful to the Admissions Committee to evaluate your application more completely.

Transferring to the PhD program
Master of Science (MSc) thesis plan students may transfer to the PhD. program following a meeting with the MSc Thesis Committee (with participation of the Outside Reader optional) at which approval to transfer is recommended. To be eligible, the student must have completed all graduate courses for the Master's degree and must have obtained a minimum 80% average. Students wishing to transfer into the PhD program must apply to do so before the end of the 3rd semester in the MSc (Thesis) program.

Qualifying Examinations
All candidates must pass a qualifying examination covering the general field of physics at the level of the honours program given at this university. The examinations must be passed no later than one year after registration as a PhD. student. Other examinations (written or oral) may be set at the discretion of the Graduate Coordinator, in consultation with the Doctoral Committee.

Degree Requirements
Dissertation: The main requirement of a doctoral degree is the presentation and acceptance of a PhD. Dissertation that describes an original and significant contribution to a field made by the candidate.

Doctoral Committee
An advisory committee consisting of the research advisor and two other faculty members in Physics will periodically review the student's progress. The Doctoral Committee must be requested by the student, and approved by the Department, and Faculty of Graduate Studies prior to the second term of registration in the PhD program.

Each candidate will, on recommendation of the doctoral committee, submit to a final oral examination in defence of the dissertation. For the defence of dissertation (final oral examination) the doctoral committee will be supplemented by one professor from outside Physics and an external examiner who, as an expert in the field of physics in which the candidate's research is carried out, will appraise the dissertation and ordinarily will also be present at the final oral examination.

Period of Study: Every student in a program leading to the degree of Doctor of Philosophy must be registered in a full-time program of study for a minimum of three calendar years, normally in succession. Credit for one of these years may be given for the time spent in proceeding to a Master's degree. Expected time to completion for a PhD program is four years of full-time study (five years for a direct-entry PhD).

Time Limit: A student admitted to a PhD. program must complete all requirements for the PhD. within six consecutive years of full-time registration. If an extension of the time limit becomes necessary, the student should address a petition to the Dean of Graduate Studies giving reasons for the request and plans for the completion of the work. A student who exceeds the time limit may be required to take additional qualifying examinations or additional course work, or both.

Course requirements:
Candidates with a Master's degree in Physics (or equivalent) must successfully complete a minimum of four courses chosen from the available graduate offerings (including PHYS-9000 seminar) in the Department of Physics. The student may be required to take additional courses, as stipulated by the student's Doctoral Committee.

(1) Candidates may substitute courses, with the permission of the student's Doctoral Committee, Graduate Coordinator, and the Faculty of Graduate Studies up to:
(i) one graduate-level course from another department (normally from the Faculty of Science or the Faculty of Engineering);
(ii) one cross-career or 4000-level course in physics.
(2) PHYS-9000 (Seminar for PhD Students) will be required of all candidates in the fall and winter terms.
(3) Students in the PhD program must register for PHYS-9980 PhD Dissertation in each term before graduation.

Candidates who do not have a Master's degree in Physics (or equivalent) must successfully complete a minimum of seven courses chosen from the available graduate offerings (including PHYS-9000) in the Department of Physics. The student may be required to take additional courses, as stipulated by the student's Doctoral Committee.
(1) Candidates may substitute courses, with the permission of the student's Doctoral Committee, Graduate
Coordinator, and the Faculty of Graduate Studies up to:
(i) two graduate-level courses from another department normally from the Faculty of Science or the Faculty of
Engineering.
(ii) two cross-career or 4000-level courses in physics
(2) PHYS-9000 (Seminar for PhD Students) is required of all candidates in the fall and winter terms. [Note: PHYS-8000 (Seminar for MSc Students) cannot be taken for credit.]
(3) Students in the PhD program must register for PHYS-9980 PhD Dissertation in each term before graduation.

Minimum Grade Required for Graduate Credit
Courses in which a grade of 70% or higher is received will be accepted for graduate credit.

Policy on Grades below 70%: In rare cases, one grade below 70% may be allowed if the grade is between 65-69%.

PHYSICS COURSES (PHYS-)

Not all of the courses listed below will necessarily be offered in any one year.

PHYS-8000. Seminar for MSc Students
In order to receive credit for this course, a student should participate in the weekly departmental seminar throughout their M.Sc. studies, and annually present a seminar on a topic approved by the Seminar Coordinator. A Pass/Fail grade will be assigned.

PHYS-8100. Advanced Quantum Theory I
General principles, representations and transformation theory. Approximation methods. Many-body problems and identical particles.

PHYS-8110. Advanced Quantum Theory II
Number representations and second quantization. Dirac equation. An introduction into quantum electrodynamics and the electro-weak theory. (Prerequisite: PHYS-8100.

PHYS-8150. Atomic and Molecular Processes I
Atomic/molecular beam methods and techniques. Collision phenomena in atomic and molecular scattering, including elastic, inelastic and reactive scattering, excitation, ionization, and charge exchange. Detailed discussion of the experimental results and their interpretation in terms of interatomic/ molecular forces and potentials.

PHYS-8151. Atomic and Molecular Processes II
A variety of topics in electron and photon collisions highlighting current advances in these fields and including total and differential elastic and inelastic scattering of electrons and positrons, resonances, polarization, coherence and correlation effects, post-collision interactions, photon-stimulation spectroscopy. (Prerequisite: PHYS-8150.

PHYS-8160. Condensed-Matter Physics
Elements of crystallography, crystal diffraction, reciprocal lattices, lattice dynamics and thermal properties of solids, phonons, solution of Schroedinger equation in periodic potential, band theory, Fermi surfaces of metals and semiconductors, optical properties of dielectrics. (May be offered as a cross-career course with PHYS-4160).

PHYS-8170. Theory of Atomic Structure and Atomic Spectra
Rotation matrices, 3n-j coefficients and graphical techniques for angular-momentum coupling, irreducible tensor operators, the Wigner-Eckart theorem and applications, the density matrix, interactions of atoms with external fields.

PHYS-8180. Molecular Spectroscopy
Diatomic molecules, Born-Oppenheimer approximation, adiabatic potentials, Hund's coupling cases, rotational, vibrational, and electronic states and associated spectra. Applications of group theory to the structure and spectra of polyatomic molecules.

PHYS-8200. Classical Electrodynamics
Radiation by moving charges, synchrotron radiation, bremsstrahlung, scattering of radiation, multipole fields, radiation reaction

PHYS-8250. Design and Application of Lasers
Stimulated emission, rate equation approach to amplification and output power calculations; Gaussian beams, stable and unstable resonators; Q-switching, mode-locking and cavity-dumping; ruby, Nd:YAG and other solid state lasers; semi-conductor, gas and dye lasers. (May be offered as a cross-career course with PHYS-4250).

PHYS-8600. Special Topics in Physics
Advanced topics in contemporary physics not normally covered in other courses. (May be repeated when the topic is different.) (Prerequisite: consent of instructor.) (May be offered as a cross-career course with PHYS-4600, PHYS-4720 or PHYS-4670, if topic is the same).

PHYS-8960. MSc Major Paper

PHYS-8970. MSc Thesis

PHYS-9000. Seminar for PhD Students
In order to receive credit for this course, a student should participate in the weekly departmental seminar throughout their PhD. studies, and annually present a seminar on a topics approved by the Seminar Coordinator. A Pass/Fail grade will be assigned.

PHYS-9610, PHYS-9620. Selected Topics in Theoretical and Experimental Physics
These courses consist of two survey lecture series to be selected from among several which will be offered each year. Each lecture series lasts for approximately half a term. Credit may not be obtained for any survey courses in subjects in which the student has taken another graduate course.

PHYS-9130. Statistical Physics I
Review of thermodynamics; information theory. The many-body problem in quantum mechanics, particle number representation. Statistical (density) matrix. The perfect gas, real gases, dense plasma, applications.

PHYS-9120. Classical and Quantum Field Theory I
Variational principles and conservation laws and applications, field equations and their solutions. (Prerequisite: PHYS-8110.)

PHYS-9121. Classical and Quantum Field Theory II
Quantization of fields; scalar, vector, and spinor fields. Quantum electrodynamics and applications; renormalization and radiative corrections. (Prerequisite: PHYS-9120.)

PHYS-9630. Advanced Topics in Condensed Matter Physics
Crystal field theory in the weak and strong coupling schemes. Molecular orbitals; vibronic interactions. Electronic structure and spectra of molecular complexes. (Prerequisite: PHYS-8110.)

PHYS-9900. Directed Studies
A special course of independent study, research, or advanced reading in a selected area of physics, conducted under the supervision of a graduate faculty member. The work completed in this course must be distinct from the student's major paper, thesis, or dissertation research. (Prerequisite: Approval of the Graduate Program Coordinator.) (The course may be taken only once for credit.) (This course will be graded on a pass/not pass basis.) (Corequisite: PHYS-9980). (This is an experiential learning course.)

PHYS-9980. PhD Dissertation

SCHOOL OF THE ENVIRONMENT

PROGRAMS

Environmental Science (MSc)

Admission Requirements
Initial Application Procedure: The initial application procedure for students who wish to enrol in the MSc. Program includes:
1) Completion of the "Application for Admission to the Faculty of Graduate Studies" form;
2) one official transcript of all undergraduate studies from all colleges and universities attended;
3) two confidential letters of reference;
4) Graduate Record Examination, if required; and TOEFL results, as required;
5) letter of intent that clearly outlines interest in the program, proposed focus of study and the prospective supervisor;

Prospective students will be encouraged to contact a potential supervisor before applying for admission to the graduate program. If a suitable supervisor cannot be identified, the student will be dissuaded from applying for admission.
For admission to the M.Sc. program, applicants must hold an appropriate Honours Bachelor's degree (or equivalent) from a recognized university. Students must maintain no less than a 77% average in their final two years of undergraduate, full-time study to be eligible for admission into the M.Sc. program.

Program Requirements
(a) Compliance with regulations outlined in University of Windsor Graduate Calendar.
(b) Successful completion of the Multi-disciplinary Graduate Seminar course (this course is taken over the first two semesters and is equivalent to two credits). The course will be graded in accordance with university standards. Following successful completion of this course, all M.Sc. students will be required to continue registering in this course as an audit.
(c) Successful completion of the Environmental Research Proposal course (MSc. level). The course will be graded according to university standards.
(d) Any additional course work mandated by the student's Examining Committee to eliminate perceived weaknesses in the student's background preparation or to increase awareness of other disciplines.
(e) Submission for publication of an original research article derived from the thesis to a refereed journal. Exemption from this requirement is granted only with permission from the Graduate Committee.
(f) Submission of a Research Progress Report to the Master's Committee every six months and a meeting with the committee to review progress and problems encountered during the preceding six months and to plan future work;
(g) Completion of an original research project reported in a thesis.
(h) Defence of the thesis in a public lecture and before the Master's Committee.

Environmental Science (PhD)

Admission Requirements
Initial Application Procedure: The initial application procedure for students who wish to enrol in the PhD. program includes:

1. Completion of the "Application for Admission to the Faculty of Graduate Studies " form;
2. one official transcript of all undergraduate and graduate studies from all colleges and universities attended;
3. three confidential letters of reference;
4. Graduate Record Examination, if required; and TOEFL results, as required;
5. letter of intent by the student that clearly outlines his/her interest in the program, proposed focus of study and the prospective supervisor.

Prospective students will be encouraged to contact a potential supervisor before applying for admission to the graduate programs. If a suitable supervisor cannot be identified, the student will be dissuaded from applying for admission.

Two streams of PhD applicants are envisaged. Applicants holding an M.Sc. degree from the University of Windsor or from another recognized university may be admitted directly to the PhD. program. Alternatively, students enrolled in the MSc program who are making exceptional progress may transfer to the PhD program after one year on the recommendation of their Master's Committee and with the approval of the Graduate Committee and the Faculty of Graduate Studies. Students eligible for transfer will have made outstanding progress in both course work and research and have a first-author research article submitted to a refereed journal at the time of transfer.

Program Requirements
Students entering the program with an M.Sc. degree must fulfill all requirements listed below:
(a) Compliance with regulations outlined in University of Windsor Graduate Calendar;
(b) Successful completion during the first year of enrolment in the program of an oral comprehensive exam, administered by the student's Doctoral Committee. Students will be required to possess comprehensive knowledge of their field of study as well as any ancillary fields relevant to the dissertation topic (as determined in advance by the Doctoral Committee). Students will be evaluated on a satisfactory/ unsatisfactory basis;
(c) Successful completion of the Multiple Stressors and Environmental Modelling course (one credit). The course will be graded in accordance with university standards;
(d) Successful completion of the GLIER Multi-disciplinary Graduate Seminar course (this course is taken over two semesters and is equivalent to two credits). The course will be graded in accordance with university standards. All PhD. students who have successfully completed this course will be required to audit the course each year following their first year of residency.
(e) Any additional course work mandated by the student's Doctoral Committee to eliminate perceived weaknesses in the student's background preparation or to increase awareness of other disciplines.
(f) Submission of a Research Progress Report to the Doctoral Committee every six months and meetings with the committee every six months to discuss progress and research plans.
(g) Completion of an original research project reported in a dissertation.
(h) Defence of the dissertation in a public lecture and before the Doctoral Committee; and
(i) publication of at least one original research article and submission of at least one additional article derived from the dissertation in a refereed journal. Exemption from this requirement is granted only with permission of the Graduate Program Committee.

Students transferring to the PhD. program must have received no grade less than 80% or satisfactory for all course work taken in the M.Sc. program. In addition, transfer students must have at least one first-author research article submitted to a refereed journal at the time of transfer. Transfer can be granted only by the Faculty of Graduate Studies acting on a recommendation from the student's Doctoral Committee and the Graduate Program Committee. Students approved for transfer into the PhD. program must comply with regulations (a) through (j) above.

In addition to courses offered in the programs, students will be advised to enroll in additional courses in other AAUs, as needed. It is expected that these courses will offer intensive treatments of particular topics to assist students in resolving perceived weaknesses. These courses are offered in a variety of AAUs including School of the Environment, Biological Sciences, and Chemistry and Biochemistry and involve various combinations of theory and lab work. All graduate students must complete the Multidisciplinary Graduate Seminar course and must complete the Environmental Research Proposal course. The Multiple Stressors and Environmental Modelling Course is required for all PhD. students. Other courses will supplement core courses, be offered on a rotating basis, and be mandated by Doctoral Committees, depending on students' perceived deficiencies in background preparation.

Earth Sciences (MSc)

As of Winter 2026, there are no new admissions to this program.

Degree Requirements

Course Requirements
The candidate for a Master's degree will be required to take ESCI-8800 and ESCI-8900, plus a minimum of two graduate courses normally from Earth and Environmental Sciences but may include courses from cognate disciplines with prior approval. Not more than one course may be in Special Topics (ESCI-8818), and not more than two courses may be from the same instructor. Additional 8000-level Science or Engineering courses may be taken on the recommendation of the student's Master's Committee. Up to three additional courses may be required to be taken as prerequisites or required background courses. The total of all courses taken shall not exceed eight. The student's Master's Committee shall recommend to the program coordinator all courses to be taken for graduate credit after discussion with the candidate. In addition, original research work must be pursued and embodied in a thesis submitted for degree credit. Credit for graduate study previously undertaken may be given for a maximum of two courses, but the duration of study at the University of Windsor may not be reduced to less than the minimum of one year.

Examination Requirements
The final examination of a candidate for the Master's degree shall be an oral defence of the thesis at a public lecture. In addition to the general requirements outlined in the section titled, The Degree of Doctor of Philosophy, the following requirements must be met by all students proceeding to the PhD. degree.

Earth Sciences (PhD)

As of Winter 2026, there are no new admissions to this program.

Admission Requirements
The normal requirement for entry into the PhD program shall be an MSc in Earth Sciences or an appropriate degree in a cognate discipline. Students who have enrolled in the MSc. program may apply to transfer to the Ph.D. program after one year of registration, and must have achieved a minimum 80% average in course work and have a strong recommendation from their thesis committee.

Degree Requirements
Students entering the PhD. program with an MSc degree will be required to:
a) Take a minimum of four, one-semester courses, including the doctoral research proposal and graduate seminar courses.
b) Additional courses may be required if the doctoral committee feels that a particular area of the student's background needs to be strengthened.

The required courses will be chosen in the context of the student's previous education to ensure a sufficient intellectual challenge, commensurate with the PhD degree.

Students transferring into the PhD program after having completed one year of the MSc degree will be required to take a minimum of six courses in total, including the doctoral research proposal and graduate seminar courses.

Grading: The minimum passing grade in graduate courses is 70%. Any student whose performance is deemed unsatisfactory in course work or research will be required to withdraw.

Doctoral Committee: The doctoral committee shall comprise the advisor(s), two other faculty members from the Department of Earth Sciences and one faculty member from another department at the University of Windsor. Other committee members can be added where appropriate (e.g. from other universities or from industry).

Research Proposals: Doctoral candidates will be required to prepare research proposals that must be successfully defended in a public forum, prior to continuation in the program. Presentation of the research proposal will normally be at the end of the first calendar year after enrollment.

Dissertation: The student will be required to submit a dissertation that is a compilation of original research carried out by the student, under the supervision of the student's advisor(s) and the doctoral committee. The dissertation may be submitted in a traditional format or as a compilation of published papers and/or manuscripts, linked by introductory and conclusion chapters. In the latter case, the contribution of the student to any jointly authored papers must be clearly stated and justified.

Progress reports: The student will submit annual research progress reports to the doctoral committee. Continuation in the program is dependent on a satisfactory progress report. The Faculty of Graduate Studies also monitors student progress via an annual progress report submitted by the student and supervisor.

Examinations
Comprehensive Examination: The comprehensive examination will normally occur at the end of the first year and will typically be held in conjunction with the defence of the research proposal. However, the two may be held at different times for logistical or other reasons. The comprehensive exam is complementary to the defence of the research proposal, and is designed to assess whether the student's scientific knowledge is appropriate for continuance in the Ph.D. program, and to ensure that the student has the background knowledge that is required for their research. A pass/fail decision will be by a majority vote of the committee. If a student should fail the comprehensive exam, he or she will be allowed to re-sit the exam within a four-month period after the first exam. The student will be required to withdraw from the program should he or she fail the second exam.

Defence: The dissertation will be defended by the student and examined by an examination committee in a public defence. The examination committee will comprise the student's doctoral committee and an external examiner.

SCHOOL OF THE ENVIRONMENT COURSES (ESCI-)

All courses listed will not necessarily be offered in any one year.

ESCI-8100. Advanced Topics in Geochemistry
A discussion of key concepts in geochemistry. Topics may include aqueous complexation and solubility, mineral stability, radiogenic and stable isotopes, fluid phase equilibria, trace elements, thermodynamics, and kinetics. (Prerequisite: consent of instructor.) (3 lecture and/or seminar hours a week.)

ESCI-8110. Advanced Topics in Geophysics
Recent advances in selected geophysical topics. Subjects may include paleomagnetism and environmental magnetism, tectonophysics, modern analytical methods or exploration geophysics. Lectures and seminars on fundamentals and selected case histories. (Prerequisite: consent of the instructor.) (3 lecture and/or seminar hours per week.)

ESCI-8310. Numerical Simulation of Subsurface Fluid Migration
Numerical modelling theory, methods and implementation into computer software for subsurface fluid flow and mass transport; finite difference method; finite element method; integral equation method; conceptual model design and sensitivity analysis; applications to exploration, environmental and engineering issues. (3 lecture/seminar hours a week.)

ESCI-8400. Advanced Topics in Igneous Petrology and Global Tectonics
Petrochemistry of igneous rocks in important geotectonic settings and implications for mantle and crustal processes. Precambrian greenstone belt magmatism and crustal evolution. Major and trace element geochemistry and stable and radiogenic isotopic systematics of igneous rocks. (Prerequisite: ESCI-8100 or consent of instructor.) (3 lecture and/or seminar hours a week.)

ESCI-8410. Advanced Topics in Sedimentology and Sedimentary Geochemistry
Principles of facies models as derived from modern environments and ancient successions; geochemistry and mineralogy of sedimentary rocks and natural waters; chemistry and mineralogy of weathering; geochemical facies analysis; fractionation of elements and isotopes during sedimentation; chemical diagenesis; organic matter and mineral diagenesis; geochemical evolution of sedimentary rocks through geologic history. (Prerequisite: ESCI-8100 or consent of instructor.) (3 lecture hours a week.)

ESCI-8420. Advanced Topics in Mineral Deposit Geology and Geochemistry
Discussion of current genetic models for selected types of mineral deposits. Ore-forming processes. Selected topics in hydrothermal geochemistry. (Prerequisite: ESCI-8100 or consent of instructor.) (3 lecture and/or seminar hours a week.)

ESCI-8700. Research Methods in Geochemistry
Sampling of geological materials. Sampling statistics. Modern analytical methods in geochemistry theory and selected applications. Data analysis. (Prerequisite: consent of instructor.) (3 lecture and/or project hours a week.)

ESCI-8710. Advanced Topics in Geoinformatics
Selected analytical and processing techniques in geographical information systems (GIS), remote sensing (RS), environmental modelling, and spatial decision support systems (SDSS). Spatial data acquisition methods and database integration. Application examples and technical issues. (Prerequisite: consent of the instructor.) (3 seminar hours per week.)

ESCI-8720. Advanced Integration of Remote Sensing and GIS Techniques
Lectures, readings and practical projects will focus on image rectification, restoration, registration, and integration of digital photographic, multispectral scanner data, radar image data and ancillary data in a GIS environment. Multitemporal data merging, change detection procedures, and multi-source image classification decision rules will also be emphasized. (Prerequisite: ESCI-8710 or consent of instructor.) (3 lecture, seminar, and/or project hours a week.)

ESCI-8730. Environmental Modelling and Spatial Simulation
The modelling process; integrating environmental models and GIS; spatial heterogeneity and representative areal units; measurement scales vs. process scales; sensitivity and uncertainty analysis; model complexity; effects of input data quality; simulation model experiments; technical and conceptual limits of environmental modelling. Students will complete a small research project. (Prerequisite: ESCI-8710, or consent of instructor.) (3 seminar hours a week, plus project.)

ESCI-8800. Graduate Seminar
Discussion of current topics in the earth sciences in seminars given by students, faculty members, and visiting speakers. Students are expected to participate in discussions and present a seminar. (Students must register in this course in the Fall and Winter terms of full-time registration in the M.Sc. program and in the first two years of the PhD program.) (1 hour a week.) (Cross-listed with GLIE-8500).

ESCI-8818. Special Topics
(May be taken for credit more than once provided that the topics are different.)

ESCI-8900. Master's Thesis Proposal
Preparation of a written report containing: a thorough review of the literature relevant to the proposed research topic; an outline of the proposed research including a discussion of the expected contributions to the subject area and how these relate to previous work; a description of the relevant methods; and the expected timetable to completion. The student shall be examined by his or her advisory committee on the content of the proposal and related background knowledge, and shall present the proposal in a public lecture.

ESCI-8970. Master's Thesis
(Cross-listed with GLIE-8970).

ESCI-9900. Doctoral Research Proposal
Preparation of a written research proposal containing: a thorough review of the literature relevant to the proposed research topic(s); an outline of the proposed research including a discussion of the expected contributions to the subject area and how these relate to previous work; a description of the relevant methods; and the expected timetable for completion. The proposal shall be presented in a public lecture. The student shall be examined by his or her advisory committee on the content of the proposal. The student must demonstrate an understanding of the context of the research project in the light of published research on the topic(s) presented, an understanding of the objectives and the methods to be used, and be able to articulate the contribution that the research will make to the advancement of knowledge. (Prerequisite: registration in the Ph.D. program.) (Cross-listed with GLIE-9980.)

ESCI-9980. Doctoral Dissertation
(Cross-listed with GLIE-9980.)

ENVIRONMENTAL SCIENCE COURSES (GLIE-)

GLIE-8500. GLIER Multidisciplinary Graduate Seminar
This course will be team-taught by core GLIER faculty who will be responsible for organizing seminar modules in their area of research expertise. Modules will include external speakers and encompass lectures and discussions utilizing a multidisciplinary approach to environmental research, and its role in developing ecosystem-based management decisions that affect large lakes and their watersheds. Students are expected to participate in discussions, prepare and deliver critiques of seminars, and present a seminar. (Required of all GLIER graduate students.) (2 hours per week for 2 semesters.) (6.0 credit course.) (Cross-listed with ESCI-8800.)

GLIE-8700. Environmental Research Proposal
A course aimed at developing proposal and grant writing skills for the academic environment. Students will prepare an original research proposal based on their research topic and defend it publicly. Students will engage in grant writing exercises, developing skills typical of those required by major funding agencies. Effective oral presentation skills will be developed. (Required of all M.Sc. students.) (2 hours per week.) 3.0 credit course.)

GLIE-9800. Multiple Stressors and Environmental Modelling
A course aimed at developing an understanding of the nature of interactive, multiple stressors on large watersheds and lakes. Stressors considered will include chemical contaminants, nutrient enrichment, species invasions, climate change, population harvesting and land use changes. Students will model and gain appreciation for how single and interactive stressors affect large lakes and their watersheds, and how confounding issues can be isolated and explored. Students are expected to prepare and participate in critiques of the published literature, and contribute an original essay that explores these issues. (Required of all GLIER PhD. students) (2 hours per week) (3.0 credit course).

GLIE-8970.Thesis
(Cross-listed with ESCI-8970.)

GLIE-9980.Dissertation
(Cross-listed with ESCI-9900 and ESCI-9980.)

RESEARCH INSTITUTES

The Great Lakes Institute for Environmental Research (GLIER)

The Great Lakes Institute for Environmental Research (GLIER) is a world-class combination of researchers, graduate programs, facilities, and location - on the Canada-US border at the heart of the world's most economically significant freshwater system.

GLIER research is currently focussed on two interrelated themes that assess the impact of multiple stressors on large lakes and their watersheds. The stressors include metal and organic chemical contamination, species invasions, climate change, harvesting of populations, nutrient enrichment, and habitat destruction. The themes are environmental chemistry and toxicology, and conservation and resource management. GLIER's 5200 m2, tri-level, dedicated facility on the Detroit River is without parallel in Canada. It includes over 25 extensively equipped laboratories, offices for researchers and post-doctoral and graduate students, and conference and meeting rooms. GLIER maintains a private boat launch on the Detroit River and has dedicated boats.

GLIER has the distinction of housing the only university-based environmental analytical laboratory in Canada accredited by the Canadian Association of Environmental Analytical Laboratories (CAEAL) to international standards of performance.

Further details of activities and facilities appear on GLIER's website at www.uwindsor.ca/glier.

Fluid Dynamics Research Institute

The Fluid Dynamics Research Institute was founded to foster interdepartmental and inter-Faculty research and postgraduate teaching related to the dynamics of fluids. Members conduct basic and applied research and are committed to providing a broad training for graduate students in all aspects of fluid mechanics and heat transfer. Members are drawn from Mechanical Engineering, Civil and Environmental Engineering, and Applied Mathematics. Research ranges from theoretical studies on stability and exact solutions to enhancement of flow measurement techniques to implementation of commercial computer codes and development of new codes for industrial problems. Application areas include civil engineering, environmental engineering, the automotive, defence and petroleum industries, biomechanics, and aeronautics. Graduate students affiliated with Institute members in their research projects will register in the member's department and complete the degree requirements of that department.

Institute for Diagnostic Imaging Research

The University of Windsor Institute for Diagnostic Imaging Research (the "Institute") is a multi-disciplinary collaborative research and innovation consortium dedicated to the development of innovative diagnostic imaging technologies and products using advanced and diverse imaging techniques. The Institute will develop intellectual property that will strengthen the University's ability to directly help diversify the region's economic sectors and increase the general competitiveness of the local region.

GLOSSARY

This glossary explains some terms which are used frequently throughout this Calendar. It is intended as a quick-reference guide and may not necessarily offer the complete, official definitions and explanations as they are applied to the University's programs and the administration of its regulations.

Antirequisite - A course or other level of attainment which, if already successfully completed, does not permit registration for credit in another course, and which cannot be taken for credit concurrently with that other course.

Attempt - Generally, any course for which a final grade has been assigned, including "WF" - Withdrew Failing. Failures which are repeated and for which credit is subsequently earned may or may not be considered as attempts, depending upon individual faculty regulations. If a student transfers from one program to another, not all previous attempts necessarily will be counted as attempts within the student's new program.

Bachelor's Degree (Baccalaureate) - The first university degree, for which a student follows a specific undergraduate program (e.g., B.A.- Bachelor of Arts).

Certificate - At the undergraduate level, a program consisting of eight to twelve one-term course equivalents in a specialized area(s) of study.

Corequisite - A course which must be taken concurrently with another course which lists it as a corequisite.

Course - A unit of study identified by a course title and a unique course number. Unless otherwise specified, the term "course" refers to a one-term, 3.0 credit course offering.

Two-Term Course - A course taught over two terms, usually the Fall and Winter terms. A two-term course normally carries twice the credit value of a one-term course, or 6.0 credits.

Half Course - A course having a value of 1.5 credits. Half courses may be offered for fewer contact hours per week over an entire term, or may be concentrated in either the first or the second half of a term.

Credit - A unit of academic value earned within a particular program. A credit value of 3.0 normally is assigned to a one-term (13-week) course. A two-term course, therefore, would have a credit value of 6.0; a half-course 1.5.

Other credit values may be assigned. Some courses may be taken for varying amounts of credit within a specific range (e.g. 2.0 to 9.0 credits); other courses may be offered for alternate credit values (e.g., 3.0 or 6.0 credits).

Credit values are used in the calculation of averages for academic standing and in the determination of the student's year or level within a specific program. (See also "Weight").

Cross-Career Courses (across levels/careers): These are courses listed under different course numbers, possibly in the same or different subject areas, but offered across different academic levels or careers.*

Cross-Listed Courses (same level/career) These are courses listed under different course numbers in different subject areas, but within the same academic level or career. Cross-listed courses may be taken in either subject area, but credit may be earned in only one course.*

*See Senate Policy on Cross-Listed and Cross-Career Courses.

Cumulative Average - An average which is based upon all courses counted as attempts within a student's career.

Diploma - At the undergraduate level, a program of study less extensive than a degree program, but requiring more courses than a certificate program.

Full-Time Student - See "Categories of Registration".

Linked Courses - Credit may not be allocated to certain courses until a subsequent course is also successfully completed. Such "linking" of courses will be noted in the course descriptions.

Major - A formal, specific concentration of courses within a subject area as defined by its degree program(s).

Major Average - An average based upon courses attempted within the student's major as defined by the student's degree program.

Part-Time Student - See "Categories of Registration".

Prerequisite - A course for which credit must have been earned prior to registration in another course which lists it as a prerequisite. ("Consent of Instructor" may be listed as an alternative to, or in addition to a given course prerequisite.)

Program - A combination of courses in a subject area (or areas) which fulfills the requirements for a degree, certificate, or diploma.

Program Approval - For students in certain programs, consulting with and obtaining the signed approval of course selections by a faculty advisor may be required as part of the registration process.

Registration - The process of selecting courses, obtaining faculty approval for course selections where necessary, and making the appropriate arrangements with the University to pay the required fees.

Required Course - A course for which credit must be earned in a student's program.

Semester - Same as "Term"

Standing Required - Individual faculties and set out specific requirements which students must meet in order to continue in their programs. These requirements normally include the maintenance of specific minimum cumulative and major averages, and also place certain restrictions upon the number of courses a student is permitted to have failed. Progress is reviewed at the end of each term.

Term - An academic period of twelve or thirteen weeks' duration. The Fall term extends from September to December; the Winter term from January to April. Intersession, which extends for six weeks from mid-May through the end of June, and Summer Session, which extends from the beginning of July to mid-August are considered together as a single term.

Transcript - A document issued by the Office of the Registrar which records all aspects of a student's registrations and grades obtained at the University. An "official" transcript is one which bears the official seal of the University and which is sent directly to another institution or official of an organization. "Unofficial" transcripts also may be issued to the student.

Withdrawal - A formal procedure set out within the regulations of the University for withdrawing from an individual course(s), or from the University entirely.

Weight - For students registered in the Faculty of Engineering, the calculation of averages is based upon a weighting factor. The weight of an individual course is equal to the number of lecture hours per week, plus one-half of the number of laboratory and/or tutorial hours per week.

Year (or Semester) - Attaining a particular Year or Semester level depends upon earning credit for a specific number of courses. The number of courses normally taken in one term/semester determines the Semester level; the number of courses normally taken in a program over both the Fall and Winter terms of a "regular" academic year would determine the Year level. In some programs, the attainment of a specific level also may reflect the earning of credits in a particular group or sequence of courses.