Toronto Metropolitan University

Graduate & Postdoctoral Studies

Yeates School of Graduate and Postdoctoral Studies

Two-Factor Authentication

As of August 1, 2019, all new students will be required to use two-factor authentication to access Toronto Metropolitan University (TMU) services. This will require students to have either a mobile phone that can run Google Authenticator or a Universal 2nd Factor (U2F) key. U2F keys are available for purchase online or in some stores.

More information on two-factor, including setup information can be found the Computing and Communications Services (CCS) Two-Factor Authentication website. https://www.torontomu.ca/ccs/services/ITSecurity/protecting-your-identity/

Registrar's Notice of Collection and Use of Student Personal Information

IMPORTANT NOTICE

By the act of enrolling or proceeding with a course of study during the 2024-2025 academic year, each student at Toronto Metropolitan University (TMU) agrees to observe and be bound by the terms of this notice, the Graduate Calendar, policies and procedures, and significant dates and the applicable terms, conditions, regulations and policies contained in the online undergraduate calendar, the university website and supplemental materials provided for students, such as the Student Guide, faculty/program student handbooks, newsletters and special communications.

TMU will be the sole arbiter in the interpretation of policies and procedures and standards for admission to its courses of study and may, without prior notice, limit enrolment in or admission to any course or program at any level.

TMU reserves the right to change, without notice, any information appearing in its Calendars pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or certificates in any of its programs.

TMU reserves the right to alter the fees and other charges described in its Calendars, the official website, as well as the TMU Student Guide, and to impose from time to time additional regulations, policies and codes of conduct. Enrolling students are expected to familiarize themselves with the Significant Dates and the Enrolment, Records and Academic Information sections contained in relevant online Calendars and subsequent editions, on the university's website, as well as with the information pertaining to the course or courses in which they are enrolled.

TMU reserves the right to withdraw or cancel programs or courses that are under-enrolled.

TMU reserves the right to make such changes in rules, regulations and promotional policies as may be required.

Course descriptions are provided in the Graduate Calendar as a matter of general information to assist present and prospective students in selecting their programs of study. While these descriptions are accurate as of the date of publication, students are cautioned that actual course content and the hours and type of instruction may vary from the listings in the Calendar or, from other course management information made available.

Students are expected to familiarize themselves with, and be governed by the rules and regulations of the program in which they are enrolled, and the promotional policies of that program.

Newly admitted students who do not enroll in courses in their first term by the fall term last day to enroll forfeit their offer of acceptance and will need to re-apply for the following admission intake.

It is the responsibility of each full-time graduate student to access the updated graduate calendar each year, and follow their curriculum as stated.

It is the responsibility of each part-time graduate student to complete the curriculum for their program as set out in the edition of the graduate calendar of the year they were admitted to their program, unless stated otherwise.

It is the responsibility of graduate students, law students and continuing education students to follow the curriculum for their programs and courses of study as outlined in the respective online calendars.

Students are to follow the Significant Dates in the current Graduate Calendar.

Additions and corrections to the Calendar will be posted.
External links are provided for the convenience of the reader. TMU does not endorse and is not responsible for the content of external sites.

Disclaimer
The Province of Ontario and Toronto Metropolitan University's response to the COVID-19 pandemic continues to evolve, and may change in response to new information. Please be advised that course offerings, curriculum, course outlines, significant dates, grading options, and, more generally, the manner of delivery of courses, programs, services, and co-curricular opportunities, are *all* subject to change or modification. Any changes to the above matters or matters related to those identified above will be in accordance with the university's policies and practices, the interpretation of which may be informed by instructions and guidance from the municipal, provincial, and federal governments, public health authorities, and considerations surrounding preventing the transmission of COVID-19, and, more generally, promoting public health, safety and wellbeing. Current tuition and fees will be maintained with more details available through the Yeates School of Graduate and Postdoctoral Studies.

The university will not be liable for any failure in, delay in, or any other issues related to academic progression arising out of any cause or causes beyond its reasonable control. Such causes may include but are not limited to fire, strike, lock-out, inability to procure materials or trades, war, mass-casualty event, flood, local, regional or global outbreak of disease or other public health emergency, social distancing or quarantine restriction, legislative or regulatory requirements, unusually severe weather, failure of public utility or common carrier, or attacks or other malicious act, including but not limited to attacks on or through the internet, or any internet service, telecommunications provider or hosting facility.

The university thanks our students, faculty and staff for their patience and flexibility as we move through these unprecedented times. We remain committed to the continued health and safety of our community, as well as the exceptional education and engaging experiences for which TMU is known.

ACADEMIC DEFINITIONS

Prerequisite: Student must pass Course A before taking Course B.

Corequisite: Student must take Course A prior to or concurrently with Course B.

Course Credits: One course credit is equivalent to a one-term course taken for one term. It has a course weight of 1.00 for the purpose of GPA calculations. One module is equivalent to half of a one-term course and is normally taught in a 6 week session.

Antirequisite: Students may not enrol in a course which lists, as an Antirequisite, one which they are also taking or in which they have already obtained standing.

Pass/Fail Courses: Are not included in GPA calculations, but are included in promotion status.

Milestone: a Milestone is a component of a program which is required for graduation, but is not offered in a traditional in-class course framework. Examples are theses, major research papers, major projects, comprehensive and candidacy examinations, dissertations, and WHIMIS certification.

The following course descriptions are a guide to courses offered through the program from time to time. **Not all courses will be offered every year. Courses are offered subject to faculty availability and are subject to change without notice.**

Courses followed by a second course number in brackets indicate that the course is offered through a joint program with another university. For example: *CC8900 (CMCT 6000 3.0) Core Issues in Cultural Studies*, indicates that the bracketed number is used at York University in the joint TMU/York Communication and Culture Program.

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AEROSPACE ENGINEERING

CURRICULUM

Professional Master's Diploma

DIPLOMA REQUIREMENTS

	PMDip Aerospace Design Management	**Credits**
AE8201	Aircraft Certification	1
AE8202	Aircraft Safety & Reliability	1
AE8203	Aircraft Systems Integration	1
AE8141	Adv Aero Manufacturing	1
AE8000	Diploma Report	Pass/Fail

Master of Applied Science

DEGREE REQUIREMENTS	**Credits**
Master's Thesis	(Milestone)
Five Elective credits	5

Master of Engineering

DEGREE REQUIREMENTS

Master's Project*	(Milestone)
Eight Elective credits	8

*students may apply to substitute 2 courses for the project.

Doctor of Philosophy

DEGREE REQUIREMENTS

Candidacy Examination	(Milestone)
Dissertation	(Milestone)
Four Elective credits	4

Electives		**Credits**
AE8102	Adv Fluid Mechanics	1
AE8104	Advanced Heat Transmission I	1
AE8105	Advanced Heat Transmission II	1
AE8106	Adv Mechanics of Solids	1
AE8108	Aircraft Turbine Engines	1
AE8112	Comp Fluid Dyn/Heat Transfer	1
AE8115	Finite Element Methods in Engr	1
AE8116	Flight Dyn/Control of Aircraft	1
AE8119	Intro to Composite Materials	1
AE8121	High Speed Aerodynamics	1
AE8129	Rocket Propulsion	1
AE8133	Space Mechanics	1
AE8135	Directed Studies/Aerospace Eng	1
AE8137	Advanced Systems Control	1
AE8138	Computational Dynamics	1
AE8139	Multi-Discip. Design/Aero Syst	1
AE8140	Adv Aero. Structural Design	1
AE8141	Adv Aero Manufacturing	1
AE8142	Aero Thermal Engineering	1

AE8143	Avionics and Navigation	1
AE8144	Comp Meth in Aero Analysis	1
AE8145	Nanomaterials and Nanocomposite	1
AE8146	Applied Aerodynamics	1
AE8147	Testing and Evaluation of Composites	1
AE8148	Spacecraft Dynamics and Control	1
AE8149	Aerospace Systems Design	1
AE8150	Special Topics: Aerodynamics & Propulsion	1
AE8151	Special Topics: Structures & Manufacturing	1
AE8152	Special Topics: Avionics & Systems	1
AE8201	Aircraft Certification	1
AE8202	Aircraft Safety & Reliability	1
AE8203	Aircraft Systems Integration	1

COURSE LISTING

Master's Thesis
The student is required to conduct advanced research on a topic related to one (or more) of the following fields: aerodynamics and propulsion; aerospace structures and aerospace manufacturing; and, avionics and aerospace systems. The topic is chosen in consultation with the student's thesis supervisor, the student presents the research plan in writing, and the research is carried out under the direction of the supervisor and monitored by a guiding committee. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the thesis to this committee, which will assess and grade the thesis. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

Master's Project
The student is required to conduct an applied advanced research project involving one (or more)of the following fields: aerodynamics and propulsion; aerospace structures and aerospace manufacturing; and, avionics and aerospace systems. The student presents the project plan in writing, and the project is carried out under the guidance of the supervisor and monitored by a guiding committee. The student must submit the completed project in the form of a technical report to an examination committee and make an oral presentation of the report to this committee, which will assess and grade the report. This is a "Milestone." Pass/Fail

Candidacy Examination
The examination consists of two parts: (i) a written examination of three hours duration, the questions to be set by the student's Supervisory Committee; and (ii) an oral defense of (a) the written examination, and (b) dissertation proposal. This is a "Milestone." Pass/Fail

Dissertation
The student is required to conduct advanced research on a topic related to one (or more) of the following fields: aerodynamics and propulsion; aerospace structures and aerospace manufacturing; and, avionics and aerospace systems. The topic is chosen in consultation with the student's thesis supervisor. The student will prepare and present a detailed research proposal prior to starting the work. The research is carried out under the direction of the supervisor(s). The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the thesis. The thesis must present original research that makes a significant contribution to knowledge in the field of study. Through the thesis, the student is expected to furnish evidence of competence in research and a deep understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

AE8000 Diploma Report
A final report is expected to analyze a current aerospace design management concept that has significant impact at the diploma candidate's place of work, or is clearly articulated in an industry case study. This report should describe, define, and provide meaningful and realistic recommendations to a specific problem in aerospace design management, organization, operation, or certification compliance. And while the diploma candidates are all encouraged to define the scope, range, and format of their individual final reports, the report topics must all be pre-approved by the Diploma Report Coordinator. Pass/Fail

AE8102 Advanced Fluid Mechanics
A general review of principles, concepts and methods in fluid dynamics will be conducted. Advanced treatment with mathematical techniques for solving specific classes of fluid-flow problems will be introduced, including: surveys of governing equations and basis theories; two and three-dimensional potential flows; surface waves; boundary-layer theory; and, shock-wave phenomenon. Antirequisite ME8102. 1 Credit

AE8104 Advanced Heat Transmission I
An advanced study of the transmission of heat by conduction and convection. Derivation and application of their equations governing steady and unsteady conduction heat transfer, transient conduction, and numerical solutions are examined with selected topics. Governing equations for forced and natural convection; dimensional analysis and similarity transforms are applied. Antirequisite ME8104. 1 Credit

AE8105 Advanced Heat Transmission II
An advanced study of the transmission of heat by radiation. Topics covered include: physical properties of radiation, thermal radiation laws, characteristics of real and ideal systems, geometric shape factors, grey and non-grey system analysis, energy transfer in absorbing media and luminous gases, solar radiation. Antirequisite ME8105. 1 Credit

AE8106 Advanced Mechanics of Solids
The class provides an introduction to the general equations of the theory of elasticity of an anisotropic solid. Elastic equilibrium and boundary value problem formulations are considered. The theories of thermoelasticity, viscoelasticity and plasticity are introduced. The class also provides an introduction to modelling of inhomogeneous composite solids, the effective moduli theory, and the elasticity of composite laminates. The fundamentals of fracture mechanics and applications to mechanical design are considered. Antirequisite ME8106. 1 Credit

AE8108 Aircraft Turbine Engines
Fluid mechanics, thermodynamics, and solid mechanics of aircraft turbine engines. Two-dimensional and three-dimensional flow theories of compressors and turbines. Unsteady flow and noise production in turbomachinery and in complete engines. Operational limitations and instabilities. Stress and associated temperature limits and influence of blade cooling techniques on turbines. Antirequisite ME8108. 1 Credit

AE8112 Computat. Fluid Dynamics & Heat Transfer
The finite difference discretization method is applied to the solution of the partial differential equations arising from the mathematical modelling of fluid flow, heat transfer and combustion processes. The equations can be parabolic, elliptic or hyperbolic. Items like convergence, stability, consistency, numerical diffusion and turbulence modelling will also be presented. Antirequisite ME8112.
1 Credit

AE8115 Finite Element Method in Engineering
This class presents formulation and implementation of the Finite Element Method (FEM) in engineering applications. The theory of variational and weighted residual methods is introduced. Different types of elements used in FEM for discretization of PDEs, such as linear, quadratic, isoparametric and hybrid elements are covered. The numerical methods selected for spatial integration, solution of linear algebraic equations, evaluation of eigenvalues are addressed. Antirequisite ME8115. 1 Credit

AE8116 Flight Dynamics and Control of Aircraft
Various analyses and tools for designing a controllable aircraft. Six-degree-of-freedom flight simulation models. Classical and modem control system techniques. Adaptive control. Digital control. Pilot-in-the-loop considerations. Antirequisite ME8116. 1 Credit

AE8119 Introduction to Composite Materials
Intended as a first course in polymer-based fiber-reinforced composite materials. Quasi-isotropic random reinforcement, orthotropic, anisotropic and sandwich construction. Classical laminate theory: lamina/laminate stress, buckling and vibration analysis. Hydrothermal, radiation and service effects on performance. Impact, delamination and fatigue failure. Overview of basic manufacturing methods and usage in the aerospace industry. Antirequisite ME8119. 1 Credit

AE8121 High Speed Aerodynamics
Planar and conical shock waves. Expansion and shock wave interference, shock tubes. Method of characteristics. Supersonic nozzle design. Airfoil theory in high subsonic, supersonic and hypersonic flows. Conical flows. Yawed, delta and polygonal wings; rolling and pitching rotations. Wing-body systems. Elements of transonic flows. Antirequisite ME8121. 1 Credit

AE8129 Rocket Propulsion
Theory, analysis and design of rocket propulsion systems. Emphasis on liquid and solid propellant systems with an introduction to advanced propulsion concepts. Review of nozzle and fluid flow relationships. Antirequisite ME8129. 1 Credit

AE8133 Space Mechanics
Motion in outer space poses complex engineering problems, the solution of which require a thorough knowledge and understanding of the pertinent principles of mechanics and techniques of analysis. The class provides an introduction to such topics as astromechanics, satellite orbits, rotating structures with varying configuration and mass, optimization of spacecraft motion, launch dynamics, microgravity, space robotics, large displacement low frequency vibrations, ground-based and in-orbit testing. Antirequisite ME8133. 1 Credit

AE8135 Directed Studies in Aerospace Eng.
This course is available to graduate students enrolled in Aerospace Engineering, who wish to gain knowledge in a specific area for which no graduate level courses are offered. Students are required to present a formal report, or take a formal examination, at the end of the course. Registration approval is required from the Graduate Program Director. 1 Credit

AE8137 Advanced Systems Control
Overview of classical controls and introduction to modern control theory. Control system modeling and analysis in state space. System controllability and observability. Pole placement control design. State observers. Introduction to nonlinear control systems. Fundamentals of Lyapunov theory. Lyapunov's direct method. System linearization. Adaptive control. Antirequisite ME8137.
1 Credit.

AE8138 Computational Dynamics
The objective of this course is to study the basic modeling and computational methods for rigid and flexible multi-body systems. Computational dynamics provides a fundamental tool for analyzing and computing the motion and force for large complex mechanical

systems, such as robots, mechanisms, machines, automobiles. Applications of computational dynamics include analysis, design and control. Analysis is to study system behaviours for given inputs through modelling and simulation. Design is to determine the prescribed functions through synthesis and optimization. Control is to control mechanical systems based on the dynamic model. Antirequisite ME8138. 1 Credit

AE8139 Multi-disciplinary Design Optimization of Aerospace Systems
Aerospace systems modeling for design and optimization. MDO concepts including selection of design variables, objective functions, and constraints. Decomposition in multi-disciplinary, coupling variables and sensitivity analysis. Soft computing in MDO. Overview of principles, methods (such as Multi-disciplinary feasible, Individual discipline feasible , Concurrent subspace optimization, Collaborative optimization, and Bi-Level Integrated Synthesis System) and tools (such as iSIGHT) in MDO for aerospace systems. 1 Credit

AE8140 Advanced Aerospace Structural Design
Structural design from a fatigue perspective involving fail-safe, safe-life and damage tolerance methodologies applied to aerospace structures manufactured from advanced materials. Major focus will be on integral aerospace structures manufactured by laser welding, laser consolidation, autoclave curing, resin-transfer molding, and adhesive bonding processes. Advanced computation techniques will be used for structural design and analysis. 1 Credit

AE8141 Advanced Aerospace Manufacturing
Aerospace manufacturing systems will be introduced at both system and machine level. The system level includes convention systems and emerging systems in terms of product quantity and variety. Conventional systems cover job shops (low quantity, high variety, such as aircraft assembly), manufacturing cells (medium quantity, medium variety, such as wing assembly), and transfer lines (high quantity, low variety, such as turbine blades manufacturing). Emerging systems cover reconfigurable systems that can be changed from a type of the conventional system to another. The machine level includes computer controlled machines and robots. The course project will focus on automation of manual processes using robotic technologies. 1 Credit

AE8142 Aerospace Thermal Engineering
Review of heat transfer fundamentals. Steady state and transient problem modeling and
computational solution techniques. Thermal management in avionics systems, jet engine components, and aircraft and spacecraft structures. Thermal management of high-speed flight, energy management and vehicle synthesis. Nucleonics, and heat transfer of nuclear-heated rockets. Thermal management in micro-propulsion systems. Applications to electronic packages, solar arrays, cryogenic and optical systems. 1 Credit

AE8143 Avionics and Navigation
This course studies navigation and estimation for air, ground, and space vehicles. We consider state estimation strategies that utilize inertial navigation systems as well as those that use external navigational aids such as GNSS and other sensor systems. Modern aircraft and spacecraft avionics systems will be studied, with particular emphasis on predicting performance and accuracy.
1 Credit

AE8144 Computational Methods in Aerodynamic Analysis
An introduction to the development of computational fluid dynamics used in aerodynamic analysis. The equations of compressible fluid dynamics and their classification will be studied. Topics in finite difference methods such as discretization, numerical stability, time marching techniques and boundary conditions will be explored using selected problems. Grid generation methods applied to structured and unstructured grids are used in solution development. The course will focus on algorithm characteristics and will rely on computer programming skills. 1 Credit

AE8145 Nanomaterials and Nanocomposities
This will be a survey course introducing some of the fundamental principles behind nanotechnology, emphasizing on nanomaterials, nanocomposites and their aerospace applications. Diverse nanomaterials and their unique mechanical, electronic, magnetic, chemical and biological properties will be reviewed. Nanoscale characterization working principles and instruments will be introduced. Various nanomaterials synthesis methods will be covered. Processing and application of nanocomposities will be discussed in detail. 1 Credit.

AE8146 Applied Aerodynamics
This course introduces students to analytical and numerical methods applicable to airfoils and wings. Students will be able to model two- and three-dimensional flows. Students will understand how to estimate lift, drag and moment of wings using analytical and numerical methods. Students will have an understanding of high-lift systems and of rotor aerodynamics. 1 Credit

AE8147 Testing and Evaluation of Composites
Quality assurance of composites; theory and practice for the determination of tensile, compressive, and shear properties of composite materials and sandwich structures; techniques for the determination of physical and chemical properties of composites; environmental testing of composite materials and structures; non-destructive techniques such as ultrasonic, acoustic emission, infrared, and lasers for evaluation of composite structures. Project on selected topics of current interest. 1 Credit

AE8148 Spacecraft Dynamics and Control
This course presents advanced methods of modelling spacecraft orbital and attitude dynamics, as well as advanced methods of orbital and attitude control. Topics covered include Lagrangian and Hamiltonian dynamics formulations, flexible spacecraft modeling, dynamical systems approach to orbital mechanics, input-output control methods and application to attitude control, optimal control and applications to low thrust trajectory design 1 Credit

AE8149 Aerospace Systems Design
Students will work as part a small team to produce a design of a special-purpose aerospace system. The project will be assigned with an emphasis on mission requirements, subsystem-oriented, team-based engineering methodology, performance modelling, optimization and trade-off studies, to produce a design that is both viable and comprehensive. Specific projects will alternate between aircraft and spacecraft applications and project details will be provided before the start of the course. 1 Credit

AE8150 Special Topics: Aerodynamics & Propulsion
This course consists of lectures, seminars, and readings covering the latest advances and research in the fields of Aerodynamics and Propulsion. The course description will be announced prior to scheduling of the course. 1 Credit

AE8151 Special Topics: Structures & Manufacturing
This course consists of lectures, seminars, and readings covering the latest advances and research the field of Aerospace Structures and Manufacturing. The course description will be announced prior to scheduling of the course. 1 Credit

AE8152 Special Topics: Avionics & Systems
This course consists of lectures, seminars, and readings covering the latest advances and research in the field of Avionics, Controls, and Systems Engineering. The course description will be announced prior to scheduling of the course. 1 Credit

AE8201 Aircraft Certification

The objective of this course is to give an understanding of the aircraft certification process in Canada, the oversight structure, and the relationship between aircraft certification in Canada and jurisdictions throughout the world. The course will concentrate on the role of Transport Canada in regulation, and the design approval structure within large aerospace manufacturers in Canada. 1 Credit

AE8202 Aircraft Safety & Reliability
Assessing aircraft safety and reliability is an integral part in the aircraft certification process. This course provides an understanding of Reliability, Maintainability, and Safety (RMS) principles, and highlights the role of RMS in aircraft design for certification and airworthiness. The1 course covers the mathematics of reliability analysis, failure modes, and fault-tree analysis. Safety assessment procedures are examined in the context of real-world examples. 1 Credit

AE8203 Aircraft Systems Integration
This course introduces integration of many key systems found in the design of an aircraft. The course will examine flight control systems, propulsion systems, hydraulic systems, electrical systems, environmental systems, avionic systems and safety systems. The course will consider system integration in the context of aircraft reliability and the certification process. 1 Credit

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ARCHITECTURE

CURRICULUM

Master of Architecture

DEGREE REQUIREMENTS		Credits
Master's Thesis Project		(Milestone)
Collaborative Competition I		(Milestone)
Collaborative Competition II		(Milestone)
AR8101	Studio in Critical Practice	3
AR8102	Seminar in Critical Practice	1
AR8103	Studio in Collaborative Practice	3
AR8104	Seminar in Contemp and Future Practice	1
AR8106	Current Topics in Architectural Praxis	1
AR8109	Contemporary Architectural Theory	1
AR8110	Thesis and Design Research	1
Two Elective Credits		2

Doctor of Philosophy

First offered Fall 2024

DEGREE REQUIREMENTS		Credits
Doctoral Dissertation		(Milestone)
Candidacy Examination		(Milestone)
Collaborative - Creative Project		(Milestone)
AR8110	Thesis and Research Design	1
Research Seminar	**one of** AR8106 or AR8228 or AR8229 or AR8230	1

Electives		Credits
AR8105	Intensive Research Studio and Seminar	4
AR8201	Advanced Construction Case Studies	1
AR8202	Architectural Theory Since 1968	1
AR8203	Architectural Writing	1
AR8204	Architecture in Public Policy	1
AR8205	The Arch. Of Urban Housing	1
AR8206	Canadian Arch. Since 1945	1
AR8207	Contemporary Theories of Urbanism	1
AR8208	Creating Space Simulation	1
AR8209	Advanced Design Methods	1
AR8210	Digital Tools	1
AR8211	Ecology	1
AR8212	Fire Safety in the Built Environment	1
AR8213	Glass in Architecture	1
AR8214	Heritage Conserv., Theory and Practice	1
AR8215	How Buildings Work	1
AR8216	Landscape and Ecological Design	1
AR8217	Landscape Design Theory and Application	1
AR8218	Performance Modeling	1
AR8219	The Small Building	1
AR8220	Sustainable Ratings Systems	1
AR8221	Architectural Representation	1

AR8222	Sustainable Housing Design	1
AR8223	Building Management System	1
AR8224	Designing the Productive City	1
AR8225	Globalization and Construction	1
AR8226	Directed Studies: Cdn Constr	1
AR8227	Minimal Housing	1
AR8228	Research Seminar: Global Communities	1
AR8229	Research Seminar: Emerging Technologies	1
AR8230	Research Seminar: Sustainable Design	1
AR8231	Selected Topics	

COURSE LISTING

Masters Thesis Project
Working closely with a faculty advisor, students will carry out independent research on an approved topic within the field of architecture, resulting in the development of a thesis report and subsequently a critical project. The student will be required to publicly present the thesis report, which forms the critical, historical, and theoretical basis for the thesis project. A comprehensive review of literature and relevant works will form a core component of this report. The thesis project must be grounded in architectural praxis, but is not limited to the design of a building. This course culminates in a public juried presentation of thesis projects. This is a "Milestone." Pass/Fail

Collaborative Competition I
In collaboration with fellow students at the graduate and undergraduate level, students take part in architectural competitions or other design activities approved by the Program Director. Competition teams will normally be led by Ryerson Faculty members. This is a "Milestone." Pass/Fail

Collaborative Competition II
In collaboration with fellow students at the graduate and undergraduate level, students take part in architectural competitions or other design activities approved by the Program Director. Competition teams will normally be led by Ryerson Faculty members. This is a "Milestone." Pass/Fail

Doctoral Dissertation
The core component of this Program is the design-led dissertation. This is a significant work of independent design-led research, punctuated at important milestones by presentation to and feedback from peers, faculty and the broader architectural and lay community. This is a "Milestone" Pass/Fail

Candidacy Examination
The Candidacy Exam takes the form of a Design Research Proposal (DRP) and will include a thorough discussion of design-research methodologies and a comprehensive literature review. Typically this would be expected to occur after the student's first year (3 semesters) in the program. This is a "Milestone" Pass/Fail

Collaborative - Creative Project
The Collaborative/Creative Project: Design Research Dissemination is normally to be completed during Year 2 of the program, and requires the production of a significant disseminated work of design related to the student's project. Depending on the nature of the project, it could take the form of an exhibition, peer-reviewed publication or other. This is a "Milestone" Pass/Fail

AR8101 Studio in Critical Practice
In this studio, students will be expected to develop a critical approach to architectural design and production. Students will be confronted with complex design problems which require a close examination of both the conditions that underlie the practice of architecture (including the students' own assumptions and beliefs) and the contexts within which and on which architectural practice acts. The development of an architectural response to these conditions and contexts, using ethical and professional judgment as well as techniques of critical analysis, will be the key objective of the studio. 3 Credits

AR8102 Seminar in Critical Practice
This course presents students with exemplars of critical practice and with methods of architectural research. The role of the architect as observer, critic, and form-maker within society will be discussed; critical practices will be discussed within the framework of contemporary directions in cultural and critical theory. The development of new technologies, either directly through research or indirectly through developing a demand, will be presented as a key role of the critical practice. Students may be asked to prepare a paper or other document which takes a critical position on a topic taken from one of the program's key areas of engagement: sustainability, technological innovation and the GTA. 1 Credit

AR8103 Studio in Collaborative Practice
Architecture is never the product of a single individual. The myth of the star architect as a heroic and creative genius is out of step with the reality of architectural practice in our increasingly complex society. Working collaboratively in teams, and with input from specialized consultants and stakeholder groups, students will develop the design of a complex building. A design process of enquiry, analysis and integration of technical, cultural, social, and economic issues will be stressed. 3 Credits

AR8104 Seminar in Contemporary and Future Practice
This course offers students a theoretical basis for working in or operating an architectural practice in the 21st century. Topics will include the legal framework for architectural practice, the role of internship, ethical and legal responsibilities, business management of a practice, future trends in practice, contracts and project management. All aspects are presented from a critical rather than a prescriptive viewpoint. Students will be asked to examine current structures of practice and propose alternatives. 1 Credit

AR8105 Intensive Research Studio and Seminar
In this course, students will work under the close supervision of an instructor on design projects related to a current issue in the instructor's area of research. Building on the introduction to research in architecture from the previous year, this course gives students an in-depth view of one research project. This course may be offered at Ryerson or off-campus, depending on the subject of the research. As part of this studio, a seminar will be offered in which students are presented with the essential characteristics and methods of research in architecture, discussed in the context of the research project being undertaken. 4 Credits

AR8106 Current Topics in Architectural Praxis
This course, offered in seminar format, will allow students in the final semester of the program to enter into a discussion of topics of current interest in architecture. Topics will vary year to year, as proposed by faculty and elected by students. To be taken concurrently with the thesis. 1 Credit

AR8109 Contemporary Architectural Theory
The theory course provides an intellectual framework within which the student will develop their own architectural position over the next two years of graduate study. The context and development of recent architectural theory will be discussed in relation to late twentieth century architectural theory and current architectural practice. The survey of theoretical perspectives in this course will culminate in the generation of each student's own theoretical position in their Thesis next year. 1 Credit

AR8110 Thesis and Design Research
Thesis significantly engages with the discipline of architecture through a student's extensive body of unique design research and rigorous academic scholarship. This course prepares students for work on their Thesis and the development of a personal architectural position. The course introduces thesis structure, approaches to critical thought, the role of theory, and research methods, as design research in architecture. Students will have prepared the foundation of their Thesis with this course. 1 Credit

AR8201 Advanced Construction Case Studies
Through lectures and a case study approach, this course investigates recently completed architectural projects, focusing on their tangible, material resolution as an expression of design intent. A major component of this course will involve students undertaking a detailed case study of one such architectural project. Antirequisite ARC730. 1 Credit

AR8202 Architectural Theory Since 1968
This course surveys major trajectories in architectural theory of the past forty years, which form one part of the context for current architectural practice. The first half of the course will focus on a number of these trajectories which can now be treated historically: semiotics, critical histories, phenomenology, deconstruction, critical regionalism, and identity politics. Building on this foundation, the second half of the course will consider current and emerging theoretical frameworks for architecture. Antirequisite ARC732. 1 Credit

AR8203 Architectural Writing
The objective of the course is to provide students with exposure to the various forms of writing related to architecture as a professional practice and critical/cultural discipline. The goal is to improve students' writing and verbal communication in the context of architectural practice and discourse. The process of critical assessment and documentation of architecture will help students focus and clarify the intentions underlying their own design work. Antirequisite ASC751. 1 Credit

AR8204 Architecture in Public Policy
This course investigates the application of architectural principles and processes to facets of public policy not traditionally addressed by the discipline of architecture. The intent is to identify how such principles and processes can shed new light on, and positively contribute to, the evolution of public policy. Some of the public policy issues to be considered include: infrastructure (transportation, waste handling, supply of water, energy and communication), social policy (relating to poverty, homelessness and health), education and governance. Antirequisite ASC750. 1 Credit

AR8205 The Architecture of Urban Housing
This course explores the impact that globalization has had upon the design and development of urban housing and its implications for critical practice in Canada. Seen through the lens of critical practice, students will be exposed to the myriad of themes, from cultural to political to economic, having an effect on the design of contemporary housing and associated living environments. This reading-intensive course comprises discussion sessions led by the instructor and/or invited guests on one or more of the subject's core themes, augmented by comparative analyses of seminal housing projects located in major cities in Western Europe, Asia, the United States, and Canada. Antirequisite ARC731. 1 Credit

AR8206 Canadian Architecture Since 1945
The objective of the course is to provide students with exposure to the recent history of Canadian architecture, from the immediate post-war to the present. Material will cover the basic conditions leading to and facilitating the spread of modernism as an important mode or architectural production and expression in post-war Canada, and its contribution to a national architectural identity, particularly in the context of Canada's celebration of the 1967 centennial of Confederation. Antirequisite ARC733. 1 Credit

AR8207 Contemporary Theories of Urbanism
This seminar course considers interrelationships between contemporary theories of urbanism, the role of urbanism as an instrument of analysis and criticism, and associated implications for critical practice in Canada. Theoretical issues surrounding urban design and strategy are investigated through the lenses of architecture, urbanism, and the humanities. Through an engagement of the writings

and projects of Le Corbusier, Rossi, Koolhaas, Venturi and others, and placing strong emphasis on interrelationships between key theoretical concepts and the generation of new urban forms, this reading-intensive course offers a comparative analysis of the changing nature of urban theory in the context of globalization. Antirequisite ASC753. 1 Credit

AR8208 Creating Space Simulation
Increasingly, computer modeling allows designers to simulate a range of performance factors of a building, including thermal performance, ventilation, lighting, acoustics, structure and others. This course will allow students to experience the use of such software and explore its potential as a tool for the design of spaces and for current architectural practice. Students will use simulation software to analyze spaces and develop design proposals based on the results of simulation. Antirequisite ASC754.
1 Credit

AR8209 Advanced Design Methods
Digital design using computer software has evolved through a number of modes of design practice. Recent software applications have introduced more fluid interfaces that allow for greater serendipitous design discovery that can emerge from sketching and experimenting with forms. Students in this course will explore the potential of a number of types of software to support the digital design process. Working with these digital tools will be placed within a general creative context. Antirequisite: ASC734 1 Credit

AR8210 Digital Tools
Digital Tools: Ways of conceiving and communicating architectural ideas. An advanced level seminar taught by department faculty members, either singly or as a team. Topics offered in various semesters will be determined by faculty expertise available. Antirequisite ASC755. 1 Credit

AR8211 Ecology
This course explores the basic dynamics of ecology through the study of varied and typical environments. The relationships among the primary factors of geology, surface deposits, hydrology, flora and fauna, together with the impact of urbanization and human activity on the natural ecosystem, are studied. 1 Credit

AR8212 Fire Safety in the Built Environment
This course provides students with an introduction to fire safety engineering. The principal objective of fire safety engineering is to provide an acceptable level of safety when an accidental fire occurs. Computational simulation software packages will be used to demonstrate fire growth and smoke movement under different scenarios. This course is designed for architecture students who have developed some basic understanding of fire and knowledge about regulations associated with fire safety in buildings. Antirequisite ASC756. 1 Credit

AR8213 Glass in Architecture
This course will take us on an in-depth study of that most expressive of modern materials and glass. The material will be looked at in a holistic manner, that is, we will approach our study from technical, historical, theoretical, and expressive directions. We will attempt to make these four trajectories not as separate paths of study, but as different elements of a single journey. Antirequisite ASC857.
1 Credit

AR8214 Heritage Conservation Theory and Practice
A course on the theoretical and practice issues of heritage conservation, particularly with regard to the preservation of buildings and sites in Ontario of architectural significance. The course reviews methods of documenting heritage resources and methodologies and techniques available for physical interventions into heritage structures. Antirequisite ARC735. 1 Credit

AR8215 How Buildings Work
Knowledge of how our buildings work is crucial to creating better architecture. Without feedback loops informing architects of the performance of their designs, most buildings become prototypes and the knowledge that could be gained from each building is lost. This course will allow students the opportunity to study, examine and understand in detail the performance of an existing building. This will help develop a perspective for the long term performance of buildings and develop an understanding of buildings as they develop after architects have completed their design. Students may be asked to select an existing building and collect detailed information on performance from uses, management, designers and client, and present a critical analysis to the group. Antirequisite ASC851. 1 Credit

AR8216 Landscape and Ecological Design
In this course students will explore the fundamentals of landscape design principles and applied ecological form. This course will focus on theories of both designed and natural composition of landscapes elements. The course objectives are achieved through lectures, field trips, case studies and in-class assignments. Antirequisite ASC852. 1 Credit

AR8217 Landscape Design, Theory, and Application
This course in landscape design, site and environmental planning engages students in the development and application of personal design philosophy towards the built and naturalistic environment. This is achieved through researching the professional work, styles and paradigms of internationally recognized architects, landscape architects, artists, planners and designers from the 19th-21st Century. Antirequisite ASC853. 1 Credit

AR8218 Performance Modeling
This course investigates issues associated with computer modeling of building performance. While the course focuses on the modeling of energy consumption and daylighting, other modeling systems will also be discussed. Principles of performance modeling will be discussed, including means for evaluating results and verifying the accuracy of the model. Antirequisite ASC854. 1 Credit

AR8219 The Small Building
Throughout history, the small building has engaged the landscape and been part of the urban environment. This course will study the small building in many cultures and will provide a greater understanding of human scale, meaning, symbol, and function, and the relationship of these factors to architecture. It is also aimed at teaching useful skills for architects, including research, writing, analysis and presentation skills. Antirequisite ASC856. 1 Credit

AR8220 Sustainable Ratings Systems
The course focuses on the environmental impact assessment method used in Canada since the launch of Canadian LEED in December 2004. Designing with LEED deals with the use of the LEED green building rating system as a design tool for the creation of environmentally responsible buildings. Other environmental issues, assessed by other methods not necessarily included in LEED, are also discussed. Antirequisite: ASC855. 1 Credit

AR8221 Architectural Representation
The emphasis of this course is to read, write and discuss issues of architectural representation. Representation, very basically-imitation with a change, is a key element in how we read and provide meaning in architecture. The main goal of this class is to learn how concepts of Representation impact the architecture that we make and the architecture that we experience. 1 Credit

AR8222 Sustainable Housing Design
Sustainable Housing deals with the design of low rise residential housing which demonstrates and promotes advanced levels of energy efficiency, resource conservation strategies, healthy environments, cultural appropriateness and sustainable development principles. Sustainable housing is viewed from a holistic approach, investigating issues as they relate to architecture, social context, building science, and mechanical systems. 1 Credit

AR8223 Building Management System
This course provides students with opportunities to explore the fundamentals of control engineering and its applications in building automation. This course focuses on how building services systems (such as HVAC, lighting and solar protection) are controlled for optimal performance and how building management systems (BMS) can help save energy and improve indoor environment control in buildings. Students will learn how to carry out integrated architectural design that allows for optimal controllability of buildings and building systems. 1 Credit

AR8224 Designing the Productive City
Architects can contribute to the transformation of our cities into more sustainable environments. This task encompasses designing higher density living and working environments, including farmers' markets, greenhouses, edible landscapes, living walls, productive green roofs, community gardens, and other strategies. The course will review these strategies and apply them to a real-world project in Toronto, looking at actual and proposed development projects that allow food production and provision inside planned and existing neighborhoods. 1 Credit

AR8225 Globalization and Construction
The objective of this course is to encourage students to think globally and to understand the growing importance of international business and globalization and how they relate to construction at large and to the Canadian construction industry. Antirequisite ASC850. 1 Credit

AR8226 Directed Studies in Canadian Construction
This course is available to internationally educated students enrolled in the graduate program in architecture, who lack the knowledge of Canadian Construction. Students are required to present appropriate assignments (exam, report, etc.) for assessment as agreed by the supervisor and program director. Registration approval is required from the program director of the M.Arch. program. Pass/Fail 1 Credit

AR8227 Minimal Housing
This course examines housing design related to the issues of affordable housing, to explore new and innovative approaches to minimal housing and to engage students in issues of affordable/minimal housing through direct involvement. Antirequisite ASC505. 1 Credit

AR8228 Research Seminar: Global Communities
What is the meaning of community in a globally connected world? How is architecture as a discipline affected by the increasingly charged relationship between the local and the global? What new insights, processes and methods does an architect need to practice effectively in such a world? In this seminar, students will prepare and present research papers discussing the architectural opportunities and consequences of globalization as well as participating in discussions and focused readings on a theme put forward by the instructor and approved by the Program Committee. 1 Credit.

AR8229 Research Seminar: Emerging Technologies
Digital fabrication, parametric design and mass customization offer not only form-making tools for designers but can also enhance the performative qualities of our buildings. How do we harness and mobilize these tools for the future? How can architecture respond to the hybridization of real and virtual spaces to enrich human experience? In this seminar, students will prepare and present research papers discussing the architectural effects of emerging technologies as well as participating in discussions and focused readings on a theme put forward by the instructor and approved by the Program Committee. 1 Credit.

AR8230 Research Seminar: Sustainable Design
How do we ensure that our world is available for the use and enjoyment of future generations? How do we offer a better quality of life to more citizens through the built environment? Beyond the design of energy-efficient buildings, our holistic view of social, cultural and economic sustainability looks to uncover and design the new infrastructures that will be needed to ensure a healthy, vital future. In this seminar, students will prepare and present research papers discussing aspects of sustainable design as well as

participating in discussions and focused readings on a theme put forward by the instructor and approved by the Program Committee. 1 Credit.

AR8231 Selected Topics

An advanced level course taught by Department faculty members. Topics offered are determined by available faculty expertise and are intended to provide opportunities for the delivery of material not already addressed in existing courses. Open to all graduate students as an elective course. Registration numbers may be limited at the program's discretion. 1 Credit

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BIOMEDICAL ENGINEERING

CURRICULUM
Corrected Fall 2024

Master of Applied Science

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		(Milestone)
BE8002	Seminars in Biomedical Engineering	Pass/Fail
BE8001	Foundations of Biomedical Engineering	1
BP8114	Anatomy and Physiology for Med. Phys.	1
Three Elective credits (One may be BE8003)		3

Master of Engineering

DEGREE REQUIREMENTS		
Master's Project **OR** BME Internship		(Milestone)
BE8001	Foundations of Biomedical Engineering	1
BP8114	Anatomy and Physiology for Med. Phys.	1
Six Elective credits (One may be BE8003)		6
	OR	
BE8001	Foundations of Biomedical Engineering	1
BP8114	Anatomy and Physiology for Med. Phys.	1
Eight Elective credits (One may be BE8003)		8

Doctor of Philosophy

DEGREE REQUIREMENTS		
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
BE8002	Seminars in Biomedical Engineering	Pass/Fail
BE8001	Foundations of Biomedical Engineering	1
BP8114	Anatomy and Physiology for Med. Phys.	1
Two Elective credits (One may be BE8003)		2

ELECTIVES

BE8003	Directed Studies in Biomedical Engineering	1
BE8101	Rehabilitation Engineering	1
BE8102	Design of Bio-MEMS	1
BE8103	Computations in Genetic Eng.	1
BE8104	Biomedical System Modeling	1
BE8105	Advanced Medical Image Analysis	1
BE8106	Advanced Magnetic Resonance Imaging	1
BP8101	Stats for the Health Sciences	1
BP8110	Biomedical Ultrasound	1
CE8201	Model and Simulation- Chem Eng	1
CE8603	Advances in Biomaterials	1
CE8605	Nanobiotechnology	1
CE8606	Advanced Topics in Tissue Engineering	1
CP8309	Special Topics:Emerging Comp Sci	1
CP8318	Machine Learning	1
EE8102	Statistical Inference	1
EE8105	Digital Signal Processing I	1

EE8111	Digital Signal Processing II	1
EE8202	Digital Image Processing I	1
EE8212	Digital Image Processing II	1
EE8606	Sel Topics: Biomedical Engr I	1
EE8610	Sel Topics: Biomedical Engr II	1
ME8115	Finite Element Methods in Engr	1
ME8130	Robotics	1
ME8150	Introduction to Microfluidics	1
ME8143	Micro and Nano Manufacturing	1

Doctoral Candidacy Examination
The aim of the candidacy exam is to assess the originality and appropriateness of the proposed research, its relevance to the program, and the students' ability to complete the research and the program. The exam consists of a written and oral component as well as a formal thesis proposal. This is a "Milestone." Pass/Fail

Doctoral Dissertation
Students are required to conduct advanced research in the area of biomedical engineering. A specific research topic must be chosen in consultation with the student's supervisor(s). The student will conduct the research under the direction of the supervisor(s). The student must submit a written dissertation to an examination committee, and make an oral presentation and defense of the dissertation to this committee. Through the dissertation, the student must demonstrate an original contribution of new knowledge to the field of research, competence in research and a deep understanding of knowledge in the area of research. This is a "Milestone." Pass/Fail

Master's Thesis
Students are required to conduct advanced research. The topic is chosen in consultation with the student's supervisor(s). The student must submit the completed research in a thesis format to an examination committee and make an oral presentation and defence of the research thesis and results to this committee. Through the thesis, students are expected to demonstrate competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

Master's Project
The student is required to conduct an applied advanced research project on a topic related to biomedical engineering. The project topic is selected in consultation with the student's advisor and monitored by an advisory committee. On completion of the project, the results are submitted in a technical report format to an examining committee and the student will make an oral presentation of the report to the committee for assessment and grading of the project and the report. The student is expected to provide evidence of competence in the carrying out of a technical project and present a sound understanding of the material associated with the research project. This is a "Milestone." Pass/Fail

BME Internship
The internship course allows MEng students enrolled in the Biomedical Engineering (BME) Graduate Program to participate in an internship to undertake a project relevant to the student's research interests and aligns with the goals of the BME program. Students are responsible for identifying host companies, securing their placements, and preparing an internship plan, subject to program approval. Internships are 150 hours (min) in duration normally spread over 8-10 weeks during a single semester. This is a "Milestone." Pass/Fail

BE8001 Foundations of Biomedical Engineering
This course will introduce students to methods for proposing research topics and subsequently developing actionable plans for conducting research in biomedical engineering. Students will be provided with tools to frame their research plans within the specific context of their sub-discipline, as well as in the wider context of medical science, biomedical engineering and clinical practice. Students will be exposed to best practices in qualitative and quantitative Methods specific to biomedical engineering. This will include common mathematical methods, theoretical modeling and experimental procedures, as well as methods related to discovery, identification, description and explanation generation. Students will engage in developing a research proposal for the purpose of planning their specific research project. Specific focus will also be placed on research ethics, culminating in a mock application to and evaluation by the local Research Ethics Board. 1 Credit

BE8002 Seminars in Biomedical Engineering
The course consists of regular research seminars in the general area of biomedical engineering, given by graduate student, faculty members, and guest speakers. MASc students are expected to give one presentation towards the end of their thesis. PhD students are expected to give one presentation before their candidacy exam and one presentation towards the end of the dissertation. Pass/Fail

BE8003 Directed Studies in Biomedical Engineering
This course is for students who wish to gain knowledge in a specific area of biomedical engineering for which no graduate level classes are offered. This course would involve a directed study for which the student(s) would be given credit. Students wishing to take the class would be assigned a suitable class advisor most familiar with the specific area of interest. Students would be required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized publication format. 1 Credit

BE8101 Rehabilitation Engineering
Engineering principles underlying the design and utilization of devices for persons with disabilities. Exposure to fabrication and design techniques. Overview of existing technology, including: limb and spinal orthoses, limb prostheses, devices aiding mobility, seating aids, reachers, robotic aids, functional electrical stimulation; sensory aids, uses of microcomputers, workplace/home modifications, devices for the aged. Effects of national policies, and challenges of technology transfer. Antirequisite: BME705 1 Credit

BE8102 Design of Bio-MEMS
Biophysical and chemical principles of biomedical microelectromechanical systems (bioMEMS) for the measurement of biological phenomena and clinical applications. Micro and nanoscale devices for the manipulation of cells and biomolecules. Topics include solidstate transducers, optical transducers, electrochemical transducers, biomedical microelectronics, microfluidics, and hybrid integration of microfabrication technology. Antirequisite: BME804 1 Credit

BE8103 Computations in Genetic Eng.
This course will introduce the computational theory and implementation of molecular database searching and sequence alignment in the context of genetic engineering. It covers databases and Internet access, sequence homology searching, multiple alignment and sequence motif analysis, and protein structure modeling and function prediction. Antirequisite: BME808. 1 Credit

BE8104 Biomedical System Modeling
Mathematical modeling of biomedical systems. Lumped and distributed models of electrical, mechanical, and chemical processes applied to cells, tissues, and organ systems. 3 hours of labs per week. Antirequisite: BME809. 1 Credit.

BE8105 Advanced Medical Image Analysis
1 Credit

BE8106 Advanced Magnetic Resonance Imaging
1 Credit

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BIOMEDICAL PHYSICS

See **PHYSICS** (from Fall 2020)

BUILDING SCIENCE

CURRICULUM

Master of Building Science (MBSc)

DEGREE REQUIREMENTS	**Credits**
Major Research Paper or Project	(Milestone)
Collaborative Workshop	(Milestone)
5 Core courses	5
Three elective credits	3

Master of Applied Science (MASc)

DEGREE REQUIREMENTS	**Credits**
Thesis	(Milestone)
Collaborative Workshop	(Milestone)
Three credits from the Core courses list (to be agreed with Program Director):	3
Two elective credits	2

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
	Experiential Learning Activity	(Milestone)
	Candidacy Examination	(Milestone)
	Dissertation	(Milestone)
BL9105	Advanced Building Science Seminar	1
Three Elective credits		3

CORE COURSES		**Credits**
BL8100	Building Science Theory	1
BL8101	Building Envelope Systems	1
BL8102	Ecological Resource Eff Desgn	1
BL8103	Energy Efficient Bldg Service	1
BL8104	Building Design Seminar/Studio	1

ELECTIVES		**Credits**
BL8201	Sustainability-Existing Bldgs	1
BL8202	Building Automation	1
BL8203	Health, Comfort, Indoor Envmnt	1
BL8204	Bldg Perform Simulation	1
BL8205	Fire Safety Design	1
BL8206	Adv Acoustic Design	1
BL8207	Bldg Performance Assessment	1
BL8208	Detail Design Project	1
BL8209	Directed Studies: Building Sci	1
BL8210	Bldg Sci and Arch Rsrch Meth	1
BL8211	Lighting Design in Buildings	1
BL8212	Renewable Energy Systems Bldgs	1
BL8213	Passive House Design and Const	1
BL8214	Life Cycle Assessment	1

BL8215	Building Envelope Restoration	1
BL8216	Special Topics	1
BL9202	Directed Studies in Building Science	1
CV8106	Advances in Concrete Materials	1
CV8306	Durability of Structures	1
ES8903	Pollution Prevention	1
ES8910	Energy and the Environment	1
ES8923	Environmental Assessment	1
ES8924	Environmental Mgmt Systems	1
ME8114	Energy Management	1

COURSE LISTING

Collaborative Workshop
An exercise whereby students who would not normally work together come together for an intensive collaborative activity. Students work in teams under the direction of Ryerson faculty members or (with the approval of the Program Director) design professionals in the community. This gives students direct experience in collaborative work with industry and community and other working design professionals, as well as community groups, university researchers from other disciplines, and artists. This will enable students to participate in a concentrated and focused special event such as a charrette or community related activity, and to work with graduate students from the Master of Architecture and undergraduate students on a specific, intensive activity. This is a Milestone. Pass/Fail

Research Paper or Project
The student is required to conduct an applied advanced research project on a topic related to building science. The student presents and agrees to the project plan with a supervisor, and the project is carried out under the guidance of the supervisor. The student must submit the completed project to an examination committee and make an oral presentation of the report to this committee, which will assess the report. This is a Milestone. Pass/Fail

Thesis
The student is required to conduct high quality research on a topic related to building science. The topic is chosen in consultation with the student's thesis supervisor, the student presents the research plan in writing, and the research is carried out under the direction of the supervisor. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the thesis to this committee, which will assess the thesis. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a Milestone. Pass/Fail

Experiential Learning Activity
This is a Milestone.

Candidacy Examination
This is a Milestone.

Dissertation
This is a Milestone.

BL8100 Building Science Theory
This course allows students to develop an advanced understanding of building science theory as it applies to sustainable design issues, and provides the foundation of technical knowledge for other courses. It includes understanding climate and solar geometry, the environment, advanced heat, air and moisture transfer, durability, and principles of modeling, Course content is relevant to the OBEC Building Science Specialist designation. 1 Credit

BL8101 Building Envelope Systems
In this course students will investigate a broad range of building envelope systems as applied to variety of building typologies in order to develop proficiency with respect to envelope performance and its relevance to durable, sustainable design. This course also addresses the impact of envelope components/assemblies on heat, air and moisture transfer through the envelope, detailing issues and constructability. The course will also provide core knowledge for the OBEC Building Science Specialist designation.
Prerequisite: BL8100. Corequisite: BL8100. 1 Credit

BL8102 Ecological and Resource Efficient Design
In this course students will have an opportunity to explore concepts such as biomimicry, closed loop systems, ecological design processes and prefabrication. Students will develop an in depth understanding of how to design to minimize the environmental impacts of material and component choices, specifications, and processes. The focus will be on resource efficiency, construction processes, and materials selection. Students will be asked to critically evaluate green building assessment systems and develop an understanding of LCA methods. 1 Credit

BL8103 Energy Efficient Bldg Services
This course provides students with opportunities to explore advanced building services systems appropriate for energy efficient buildings and to investigate renewable energy systems in buildings. The course will focus on a number of selected techniques, such as combined heat and power (CHP), solar energy systems, ground source heat pumps, etc. Students will develop knowledge and skills that enable them to carry out relevant work in research, design, evaluation, commissioning and development. Prerequisite: BL8100, BL8101. Corequisite: BL8100, BL8101. 1 Credit

BL8104 Building Design Seminar/Studio
This seminar/studio course will focus on a design exercise/project aiming to develop and apply advanced knowledge of low energy design, exploring passive design, building form, construction technologies, and systems integration. Areas of study may include, net zero energy, natural lighting design, and integration of renewable energy. The use of appropriate methods of appraisal of passive systems and their integration will be considered. Prerequisite: BL8101, BL8103. Corequisite: BL8101, BL8103. 1 Credit

BL8201 Sustainability, Heritage and Existing Buildings
This course considers the relationship between heritage and environment conservation. Students will develop the theoretical knowledge and the building science principles necessary for extending the life and improving the performance of heritage and other existing buildings. Students will develop an understanding of the theory and role of standards, testing and survey protocols, and will apply this in practice. There will also be a consideration of the economic basis of decision making. Course content is relevant to the OBEC Building Science Specialist designation. 1 Credit

BL8202 Building Automation
This course deals with the control of typical building service systems and equipment. It covers the methods and techniques used to control and operate building devices in order to optimize the indoor environment quality and to minimize the energy consumption and the operation costs. After completing the course, students are expected to be able to understand how typical building systems should be controlled, to design building automation systems for simple buildings, and to understand the principle of building automation and opportunities it offers. 1 Credit

BL8203 Health, Human Comfort and Indoor Environment
Students will have an opportunity to develop an understanding of human comfort and the health impacts of spaces, forms, materials and ventilation systems. This will include the effect of materials selection, maintenance and ventilation, how design issues affect productivity; and how users perceive and experience spaces. 1 Credit

BL8204 Building Performance Simulation/Modeling
Simulation can be used as a teaching and research tool in the area of air movement, indoor air, wind impact, fire safety, energy efficiency, lighting, etc. Principle of modeling and computational simulation will be explored. This course will make students become familiar with the potential for building simulation programs particularly to improve energy performance and understand the techniques of simulation, why and when such programs can be best used. Students will develop critical skills necessary to assess the appropriate choice of procedure and precision at different stages of the design process. This course may be offered in association with the Department of Mechanical Engineering. 1 Credit

BL8205 Fire Safety Design
Fire safety engineering is the application of scientific and engineering principles based on an understanding of the phenomena and effects of fire and of the behaviour of people to fire, to protect people, property and the environment from the destructive effects of fire. This course addresses multi-disciplinary aspects involving chemistry (e.g. the behaviour of materials), physics (e.g. heat transfer, movement of smoke), civil engineering (e.g. deformation of structures), electrical and mechanical engineering, and psychology (e.g. behaviours of people). Students will explore how to provide an acceptable level of safety when an accidental fire occurs and consider the implications on innovative and experimental sustainable design solutions. 1 Credit

BL8206 Advanced Acoustic Design
This course will provide students with opportunities to explore in depth how to provide appropriate acoustical environments within different building types, and the implications on materials use and other aspects of performance. 1 Credit

BL8207 Building Performance Assessment
This course focuses on the complex issue of assessing existing buildings for their overall performance, particularly energy use, environmental impact and occupant satisfaction and to identify potential for improvement. This is key to ensuring that sustainable buildings perform to their potential. Post-occupancy building evaluations will be used and outputs compared to performance benchmarks on which buildings can be rated and compared. Students will have the opportunity to carry out an in depth study of a range of aspects of the performance of a building through measurement, surveys, investigations, etc. 1 Credit

BL8208 Detail Design Project
This course will focus on a detail design problem and will be run as a project based course. The design will relate to some element of sustainable construction detailing focusing construction systems proposed for sustainable building projects. The course will allow students to investigate in detail a particular element or type of construction and develop appropriate design proposals. 1 Credit

BL8209 Directed Studies in Building Science
With the approval of the program director and supervisor, students enrolled in the graduate program in Building Science may take a Directed Study course to gain knowledge in an area relevant to their research for which no graduate level course is offered. A faculty member must supervise the study, and appropriate assignments (exam, report, etc) will be agreed upon before registration. 1 Credit

BL8210 Building Science and Architectural Research Methods
This course is intended to prepare students to develop and undertake research projects related to architectural science. It will allow students to understand that research is systematic inquiry directed toward the creation of knowledge. Course will allow students to become familiar with and apply several research strategies and methods in architectural science. 1 Credit

BL8211 Lighting Design in Buildings
This course will provide students with opportunities to explore in depth the design process for the lighting system design. The lighting metrics use for design will be introduced. Simple computational methods will be presented. In addition detailed Radiosity evaluation using AGI32 software will be highlighted. Day lighting methods will be one of the main design applications that would be studied in this course. 1 Credit

BL8212 Renewable Energy systems in Buildings
This course will provide students with opportunities to explore in depth the design process for renewable energy system integration into buildings. The characteristics of various available technologies and systems will be reviewed and simple computational methods will be presented. 1 Credit

BL8213 Passive House Design and Construction
Students will gain a detailed understanding of low energy housing design and the passive house system. Students will learn about the Passive House principles, the PHPP software and how to use these tools to design energy efficient housing. 1 Credit

BL8214 Life Cycle Assessment
This course will be an investigation of the principles of the Life Cycle Assessment (LCA). The student will learn about the benefits of LCA to sustainable design, and how it can be used to aid in decision making in building design. The course will focus on understanding how LCA can quantify the environmental impacts of alternative strategies and will also consider the way LCA software tools such as Athena can be used as design and research tools. 1 Credit

BL8215 Building Envelope Restoration
This course considers investigation, design and contracting the building envelope restoration process. Students will develop knowledge of various investigation techniques used in building envelope diagnostics and learn how to recognize indicators of poor performance, deficiencies and failures. The course also covers the design of remedial repair strategies, including preparation of remedial repair documents, material selection and compatibility, the tendering process and contract administration. Prerequisite: BL8100 and BL8101 or with the approval of the Building Science Graduate Program Director. 1 Credit

BL8216 Special Topics
This course is offered to deliver content that is not offered by current core and/or elective courses in the Graduate Program in Building Science. The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course. 1 Credit

BL9105 Advanced Building Science Seminar
1 Credit

BL9202 Directed Studies in Building Science (PhD)
With the approval of the program director and supervisor, students enrolled in the doctoral program in Building Science may take a Directed Study course to gain knowledge in an area relevant to their research for which no graduate level course is offered. A faculty member must supervise the study, and appropriate assignments (exam, report, etc) will be agreed upon before registration. 1 Credit

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CHEMICAL ENGINEERING

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS		Credits
Master's Thesis		(Milestone)
CE8102	Seminars in Chemical Engineering	Pass/Fail
Four electives (maximum of one from Group II)		4

Master of Engineering

DEGREE REQUIREMENTS	Credits
Master's Project*	(Milestone)
Eight Electives (max. of two from Group II)	8

* Students may apply to substitute two courses for the Project

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Dissertation		(Milestone)
CE8102	Seminars in Chemical Engineering	Pass/Fail
Four Elective credits from Group I		4

ELECTIVES

Group I		Credits
CE8140	Statistics for Engineering	1
CE8141	Research Methods and Communications	1
CE8201	Model and Simulation- Chem Eng	1
CE8202	Advanced Process Control	1
CE8203	Applied Optimal Control	1
CE8213	Advanced Numerical Methods	1
CE8214	Optimization in Chemical Engineering	1
CE8301	Advanced Transport Phenomena	1
CE8303	Advanced Fluid Dynamics	1
CE8304	Rheology	1
CE8402	Applied Thermodynamics	1
CE8403	Advanced Reactor Engineering	1
CE8410	Electrochemical Engineering	1
CE8501	Polymer Science and Engineering	1
CE8603	Advances in Biomaterials	1
CE8604	Advances in Porous Materials	1
CE8606	Advanced Topics in Tissue Engineering	1
CE8610	Artificial Intelligence in Chem Eng	1
CE8703	Adv Water Treatment Tech	1
CE8711	Environmental Nanotechnology	1
CE8100	Directed St: Chem Eng (MASc)	1
CE9100	Directed St: Chem Eng (PhD)	1

Group II		
CE8210	Process and Engr Optimization	1
CE8331	Membrane Technology	1
CE8510	Plastic Technology	1
CE8710	Air Pollution and Control	1

COURSE LISTING

Master's Thesis
The student is required to conduct advanced research on a topic related to chemical engineering mainly in the water-wastewater/food treatment and polymer/chemical processing areas. The research topic is selected in consultation with the student's supervisor(s), where the student presents an outline of the research plan in writing, and the research is carried out under the direction of a faculty supervisor(s) and monitored by a thesis supervisory committee. On completion, the student is required to give an oral presentation on the research results in the Graduate Research Seminar Series. The research results are then submitted in a thesis format to the supervisor(s) and to an examining committee, before which an oral presentation is made for the assessment and grading of the thesis. Through the thesis, the student is expected to provide evidence of competence in carrying out research and a sound understanding of the material associated with the research. This is a "Milestone." Pass/Fail

Master's Project
The student is required to conduct an applied advanced research project on a topic related to chemical engineering. The project topic is selected in consultation with the student's advisor, where the student presents an outline of the project plan in writing, and then is carried out under the direction of a faculty advisor and monitored by an advisory committee. On completion of the project, the results are submitted in a technical report format to the advisor and then to an examining committee, which an oral presentation is made for assessment and grading of the project and the report. The student is expected to provide evidence of competence in the carrying out of a technical project and present a sound understanding of the material associated with the research project. This is a "Milestone." Pass/Fail

Doctoral Dissertation
The PhD student is required to conduct advanced research on a topic related to chemical engineering, mainly in the water-wastewater/food treatment and polymer/chemical processing areas. The research topic is selected in consultation with the student's supervisor(s). The student presents a proposal of the research plan in writing to a supervisory committee, and orally in the Graduate Research Seminar Series prior to taking a candidacy exam. The research is carried out under the direction of a faculty supervisor(s) and monitored by a supervisory committee. On completion, the student is required to give an oral presentation on the research results in the Graduate Research Seminar Series. The research results are then submitted in a dissertation format to the supervisor(s) and to an examining committee, before which an oral presentation is made for the assessment and grading of the dissertation. Through the dissertation, the student is expected to provide evidence of competence in carrying out original and independent research and a sound understanding of the material associated with the research. Pass/Fail

CE8100 Directed Studies in Chemical Engineering (MASc)
This course is for master's students who wish to gain knowledge in a specific area for which no graduate level classes are offered. This course would involve a directed study for which the student(s) would be given credit. Students wishing to take the class would be assigned a suitable class advisor most familiar with the specific area of interest. Students would be required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study), in an organized publication format. 1 Credit

CE8102 Seminars in Chemical Engineering
This course consists of presentations by graduate students, faculty members, and external speakers, if applicable. MASc and PhD students are required to attend all seminars while in the program. MASc students are required to give one presentation towards the end of his/her thesis. PhD students are required to give one presentation before his/her candidacy exam and one presentation towards the end of the dissertation. MEng students are encouraged to attend all seminars. Pass/Fail

CE8140 Statistics for Engineering
This course examines the role of the statistical design of experiments and data analysis for exploring the effect of one or more factors on one or more responses in the context of research experimentation, process troubleshooting, continuous process improvement and product development. Data analysis techniques such as regression analysis and the analysis of variance will be discussed in detail. The application of screening designs, single and multifactor including two-level factorial designs, response surface designs such as central composite and Box-Behnken designs will be covered. Finally, designed experiments will be compared with un-designed experiments. 1 Credit

CE8141 Research Methods and Comms.
This course on research methods will focus on methods for developing a research problem and honing scientific communication skills of graduate students. Effective communication is an essential part of science. The students will be trained on effective literature review, technical writing (manuscripts, proposals, and letters), best practices on quantitative and qualitative data reporting, and oral and poster presentation skills. 1 Credit

CE8201 Modelling & Simulation in Chemical Eng.
Principles of process modeling; modeling of steady state, and unsteady state processes leading to problem formulation; numerical solutions of linear and non-linear algebraic equations, ordinary differential equations, and partial differential equations; analytical solutions of ordinary and partial differential equations; advanced techniques of computer programming; introduction to object-oriented paradigm; computer simulation of chemical engineering processes; examples from thermodynamics, fluid mechanics, heat transfer, mass transfer, and chemical reaction engineering. 1 Credit

CE8202 Advanced Process Control
System identification. Review of linear control systems and state space. Design methods of multivariable control systems. Model Predictive Control: Internal Model Control (IMC) and Dynamic Matrix Control. Applications to chemical processes. 1 Credit

CE8203 Applied Optimal Control
Optimal control and optimization. Examples of optimal control problems. Functionals and their classification. Differentials of functionals. Optimality of optimal control problems-necessary and sufficient conditions. Lagrange and John Multiplier Theorems. Their applications to optimal control problems. Pontryagin's principle. Problems with different types of constraints. Optimal periodic control-necessary conditions for optimum and the Pi criterion. Numerical solution of optimal control problems. 1 Credit

CE8210 Process & Engineering Optimization
The use of optimization methods is pervasive throughout the process industries. Thus, these techniques are an important part of a chemical engineer's tool set. This course will provide a blend of important theoretical concepts and practical implementation issues. The development of a student's ability to formulate optimization problems, select solution techniques and interpret results will be emphasized. Finally, through a series of industrially relevant problem sets, the students will gain exposure to popular optimization software. Extra project/assignments are required, weighing no less than 20-30% of the final grade. Antirequisite CHE425. 1 Credit

CE8213 Advanced Numerical Methods
Review of numerical analysis. Includes: solution of systems of linear and nonlinear algebraic equations, interpolation, least squares fitting, integral and derivative evaluations, and solution of ordinary and partial differential equations. Introduction to the numerical solution of systems of linear and nonlinear partial differential equations using finite difference and finite element methods. Includes: error analysis, non-uniqueness and stability in nonlinear systems, continuation, isoparametric mapping, time integration techniques, time step controller, and mesh refinement strategies. Includes practical applications to science and engineering. Programming is required throughout the course. Antirequisite EN8913. 1 Credit

CE8214 Optimization in Chemical Engineering
This course will introduce optimization theory, methods and applications in chemical engineering. Topics will comprise single and multi-variable, functional, dynamic and multi-objective optimization. Classical and modern computational solution algorithms will be covered, including evolutionary and artificial intelligence-based techniques. Emphasis will be placed on problem solving using important software and programming tools. 1 Credit

CE8301 Advanced Transport Phenomena
Differential and integral balances applied to isothermal and non-isothermal systems, interphase transport in non-isothermal, single component and multi-component systems. Heat and mass transfer in packed and fluidized beds. 1 Credit

CE8303 Advanced Fluid Dynamics
Vectors and tensors; introduction to fluid dynamics; kinematics; microscopic mass and momentum balances; exact solutions of the Navier-Stokes equations; dimensional analysis and similitude; flows with negligible acceleration; high Reynolds number flows; regions far from boundaries (the Boundary Layer Theory); hydrodynamic stability; turbulence; macroscopic balances for isothermal systems; non-Newtonian fluid behaviour. 1 Credit

CE8304 Rheology
Rheology is the study of the deformation and flow of matter. This field is dominated by inquiry into the flow behavior of complex fluids such as polymers, foods, biological systems, slurries, suspensions, emulsions, pastes, and other compounds. The students will be introduced to the principles, measurements, and applications of rheology. 1 Credit

CE8331 Membrane Technology
A study of material transport in membranes and of the modes of operation. Modeling of mass transfer in membrane processes will also be discussed. Emphasis will be on the design and applications of various membrane processes in industry, such as: membrane filtration, reverse osmosis, gas permeation and pervaporation. Extra project/assignments are required, weighing no less than 20-30% of the final grade. Antirequisite CHE715. 1 Credit

CE8402 Applied Thermodynamics.
Definitions and basic principles; conservation of mass and energy; concept of entropy; equations of change with applications; thermodynamic properties and their determination based on the change of state of system; equilibrium and stability criteria, and their applications to single and multi-component systems; Gibbs free energy and the concept of fugacity; phase equilibrium and its calculation using various thermodynamic models, and computational algorithms; chemical equilibrium in single-phase systems; chemical equilibrium of reacting mixtures; combined phase and chemical equilibrium. 1 Credit

CE8403 Advanced Reactor Engineering
Reaction kinetics, stoichiometry and pathways; Reaction data and analysis; Design of ideal reactors; Catalysis; Mass transfer effects; Residence time distribution; Biological reactions; Modeling and simulation of reactors under isothermal, non-isothermal, steady state, and unsteady state conditions; Reactor optimization; Scale up principles. 1 Credit

CE8410 Electrochemical Engineering
This interdisciplinary engineering science course covers the topics and applications of electrochemistry and electrochemical engineering. Topics addressed are: (1) thermodynamics, kinetics and transport phenomena in electrochem. Systems; (2) elements of electrochem. systems including electrolytes, electrocatalysts, and electrodes; (3) electrochemical processes and applications including corrosion, electrodialysis, electrochlorination and electrochem. energy conversion and storage devices. 1 Credit

CE8501 Polymer Science and Engineering
Definitions and basic principles; polymerization mechanisms; kinetics of polymerization reactions; thermodynamics of polymer-solvent phase equilibria; diffusion and mass transfer in polymer systems; heat transfer and non-isothermal effects in polymer systems; polymer processing; mathematical modeling of mixing, extrusion, postdie processing, molding and forming. 1 Credit

CE8510 Plastic Technology
Materials: classification and general properties of plastics, thermosets, thermoplastics, commodity plastics, engineering plastics, fillers and reinforcements. Polymer manufacturing processes. Converting operations: injection moulding, compression moulding, extrusion, blow moulding, wire and cable coating, thermoforming. Extra project/assignments are required, weighing no less than 20-30% of the final grade. Antirequisite CHE451. 1 Credit

CE8603 Advances in Biomaterials

This course introduces principles of materials engineering, important aspects of biocompatibility and response of the tissues to biomaterials, fundamentals of biomaterials engineering including design of new biomaterials for biomedical applications such as dental, orthopedics, and artificial implants. 1 Credit

CE8604 Advances in Porous Materials
Introduction and classifications of porous materials. Syntheses and characterizations of porous materials. Self-assembly and nanotechnology of porous materials. Adsorption and diffusion in porous materials. Applications of porous materials in heterogeneous catalysis, membranes for environmental remediation, and sustainable energy. 1 Credit

CE8606 Advanced Topics in Tissue Engineering
This course covers advanced topics in *tissue engineering*: the interdisciplinary field that encompasses biology, chemistry, medical sciences and engineering to design and fabricate living systems to replace damaged or diseased tissues and organs. Integrative exploration of tissue anatomy, cell biology, biomaterial scaffolds, cell sources and differentiation, design considerations, diffusion and mass transfer limitations, effects of external stimuli, bioreactors, methods used to evaluate the engineered product(s), and implantation models. Antirequisite: BME703 1 Credit

CE8610 Artificial Intelligence in Chem Eng
This course will introduce the fundamentals of Artificial Intelligence (AI), and its utilization in solving problems related to chemical engineering. Core AI topics will be taught that include intelligent agents, conventional and evolutionary search methods, knowledge representation and reasoning, planning and decisions-making, machine learning, and artificial neural networks. Important applications in chemical engineering will be covered. 1 Credit

CE8703 Adv. Water Treatment Technologies
Covers the sources of water and wastewater, and analytical characterization of water and wastewater. It also covers advanced oxidation technologies such as UV, UV/hydrogen peroxide, photocatalysis, and other advanced oxidation processes. Biological treatment of water and wastewater will also be discussed . 1 Credit

CE8710 Air Pollution and Control
A study of air pollution and general control methods. Air pollution measurements and emission estimates will be discussed. Fixed-box and diffusion models for air pollutant concentration will be introduced. Emphasis will be given on design of typical air pollution control equipment for volatile organic compounds (VOC), sulphur dioxide, nitrogen oxides. Introduction to control of particulate pollutants will also be included. Extra project/assignments are required, weighing no less than 20-30% of the final grade. Antirequisite CHE615. 1 Credit

CE8711 Environmental Nanotechnology
This course covers the implications and applications of nanotechnology in the environment. The major topics are (1) An overview of synthesis, properties and characterization of engineered nanomaterials with applications in consumer products, (2) Fate, transport and transformation of nanomaterials in the aquatic environments, and (3) Nano-enabled technologies such as novel filters, adsorbents, membranes, and catalysts for removal and transformation of legacy and emerging contaminants of concern. 1 Credit

CE8802 Wastes from Food Processing
Sources, composition and properties of wastes in the food processing industry. Interaction between chemical components and microorganisms present in food wastes. Biotransformations. Introduction to regulatory guidelines. Systematic procedures for the design of waste process plants, process requirements, utility needs, and associated capital and operating costs. 1 Credit

CE9100 Directed St in Chemical Engineering (PhD)
This course is for PhD students who wish to gain knowledge in a specific area for which no graduate level class is offered. It would involve a directed study for which the student would be given credit. Students wishing to take the class would be assigned an advisor most familiar with the specific area of interest. Students would be required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study), in an organized publication format. 1 Credit

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CHILD AND YOUTH CARE

Revised Fall 2021

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS

		Credits
CY8001	Child and Youth Care Theory	1
CY8002	CYC Research Methods	1
CY8003	CYC Adv. Therapeutic Practice	1
CY8011	Critical Ethical Practice	1
CY8013	Power & Resistance in Child & Youth Care	1

AND one of the following options

THERAPEUTIC OPTION

CY8000	Child and Youth Care Internship	Pass/Fail
CY8012	Therapeutic Practice Internship	1
One elective	From CYC electives or another approved graduate program course	1

OR

RESEARCH AND POLICY OPTION

Major Research Paper		Milestone
CY8004	CYC Management and Policy Dev	1

ELECTIVES

CY8005	International CYC Practice	1
CY8006	Supervision in CYC Practice	1
CY8007	Online Relational CYC Practice	1
CY8008	Social Innovation in CYC	1
CY8009	Children's Rights in Practice	1
CY8010	Directed Studies in CYC	1
CS8924	Inclusion: Issues in Assessment	1
CS8926	Risk and Resilience	1
CS8938	Cross-Cultural Development	1
CS8903	Children Families Communities	1
CS8936	Children's Rights	1
MN8911	Population Health and Health Promotion	1
MN8931	Diversity & Globalization: Promoting	1
MN8936	Advanced Therapeutic Communication	1
SK8202	Critical Perspectives in Child Welfare	1
SK8208	Indigenous Knowledge in Social Work	1

COURSE LISTING

Major Research Paper
The requirement for MRPs is a 50-page paper on an approved Child and Youth Care (CYC) focused topic that includes a thorough literature review and an original research contribution (which could be a systematic literature review or a small qualitative, quantitative or mixed-methods study). MRPs will be guided by an assigned supervisor from amongst the RFA faculty members of the School of Child & Youth Care, and will be evaluated in writing and through an oral defense by the Supervisor and a Second Reader, who could be a CYC faculty member or any Full or Associate member of the Yeates School of Graduate Studies. This is a "Milestone"

CY8000 Child and Youth Care Internship
Students will complete 225 hours of internship during this course. Advanced practice internships will take place in regulated service settings within Children's Mental Health, Child Welfare, Education, Hospitals or Community and other major agencies in child and youth serving sectors. Pass/Fail.

CY8001 Child and Youth Care Theory
Theoretical foundations of CYC practice are explored, from its beginnings in allied disciplines to formation of field-specific theoretical and conceptual frameworks. Using classic texts that emerged from the life-space orientation of leaders such as Fritz Redl, Bruno Bettelheim, Al Treischman and Henry Maier, students engage contemporary core concepts including use of Daily Life Events, life-space intervention, relational practice, exploration of Self, Meaning Making and context of interaction. Hybrid offering. 1 Credit

CY8002 CYC Research Methods
The course enhances research design and analysis skills by focusing on a conceptual understanding of research and evaluation methods utilized in CYC contexts including narrative, appreciative, and critical inquiries, quantitative data collection, management and analysis, and metrics to evaluate broader social impact of program initiatives in child and youth serving settings. Students plan, create and undertake systematic literature review to build evidence for their Major Research Paper. 1 Credit

CY8003 CYC Adv. Therapeutic Practice
A trauma informed perspective focused on attachment, a systemic lens and a narrative approach to engagement forms the foundations of this course. Exposure to various models of clinical supervision including clinical reflecting teams, peer debriefing techniques, simulated "real-world" clinical scenarios and critical self-reflection through video clips and transcripts develops clinical skills to assess and deliver culturally and contextually informed interventions with children and their families. 1 Credit

CY8004 CYC Management and Policy Dev
This course focuses on the roles and responsibilities of program management and leadership in child and youth serving contexts. An explicitly child and youth care-informed approach to management and innovation is explored, and ultimately integrated into social innovation strategies designed to respond to specific mental health, child protection or child and youth well-being contexts. The course explores policy frameworks central to the child and youth serving sector in Ontario and Canada. 1 Credit

CY8005 International CYC Practice
This course examines use and adaptation of core child and youth care concepts like life-space intervention, use of Daily Life Events, and Meaning Making in cultural, socio-economic and resource contexts across the globe. Students explore theoretical frameworks of Isibindi (South Africa), Social Pedagogy (Germany), and professional and organizational CYC landscape in US, UK, Ireland and elsewhere. This course facilitates international placement opportunities for interested students. 1 Credit

CY8006 Supervision in CYC Practice
This course provides a comprehensive understanding of life-space approaches to supervision consistent with relational practice, so that graduates can provide effective supervision to direct care practitioners in a range of settings. The course enhances students' knowledge of effective supervisory practice, emphasizes the use of momentary encounters to help practitioners develop skills needed within each working context and examines impact of culture, context and self on the supervisory process. 1 Credit

CY8007 Online Relational CYC Practice
Incorporating ecological-cyber systems framework and a children's rights perspective, students examine the potential of cyberspace for intervention in the life-space of children, youth and families. Supervised online counselling simulations push students beyond the theoretical to develop cyber counselling and online relationship building skills. Strengths and limitations of electronic modalities and ethical issues like confidentiality, privacy, boundaries, and informed consent are investigated. 1 Credit

CY8008 Social Innovation in CYC
This course explores emergent social innovation concepts of collaboration, transcending deeply embedded problem structures and processes, landscape approaches to inter-professional and cross-jurisdictional work, social finance, ethical dilemmas in change-making and implications of increasing partnerships between public/non-profit and private sectors. The focus is on embedding innovation and change-oriented practices, fluid team structures and managing multi-layered complexity in CYC systems. 1 Credit

CY8009 Children's Rights in Practice
This course examines the substantive and procedural implications of children's rights upon practice in the field of child and youth care. Exploration includes consideration of therapeutic practice, research, management and policy through elements like language, rights-based approaches, processes, structures and monitoring results. Understanding and critical analysis of CYC issues will be advanced, implications identified, and appropriate follow-up explored from a child rights-based approach. 1 Credit

CY8010 Directed Studies in CYC
Students arrange to work with an individual faculty member on a course designed to pursue readings and learning in a specific area relevant to child and youth care. 1 Credit

CY8011 Critical Ethical Practice
Drawing from child and youth care (CYC) and allied disciplines, this course applies equitable, ethical practice principles to assessment, intervention, and program planning in healthcare, education, child welfare, criminal justice, community and recreational settings. CYCCB Standards for Practice of North American CYC Professionals are introduced through varied lenses: Indigenous and Africentric paradigms, feminist and critical race-theories, politicized praxis and radical youth work principles. 1 credit.

CY8012 Therapeutic Practice Internship
This course explores student's experiences in community-based placements through 225 placement hours. As emerging practitioners, students will critically assess organization mandate and culture, and identify and understand themes that arise within the placement agency at the case and organizational levels within a CYC practice framework. Students begin to develop an understanding of culturally and contextually responsive interventions that inform pathways to intentional and meaningful change. 1 credit.

CY8013 Power & Resistance in Child & Youth Care
This course critically explores how historical and current relations of power undergird social structures, institutions, and practices in Canada and examines their relations to CYC. Discussions and readings expose issues that span identities of race, gender, gender and sexual identities and orientations, cultural and religious expressions, social class and abilities/dis-abilities. Students will grapple with the multiple entanglements and 'messiness' inherent in exploring these discourses. 1 credit
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CIVIL ENGINEERING

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS		Credits
Research Presentation		(Milestone)
Master's Thesis		(Milestone)
CV8010	Master's Research Seminar	Pass/Fail
Five Elective credits (One may be a Directed Studies course)		5

Master of Engineering

DEGREE REQUIREMENTS		Credits
Ten Elective credits (One may be a Directed Studies course)		10
OR		
Students with the permission of the Program Director may complete eight elective courses and a Master's Project		8
Master's Project	(optional with permission 8 courses + Project)	(Milestone)

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Research Presentation		(Milestone)
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
CV8020	PhD Research Seminar	Pass/Fail
Four Elective credits (One may be a Directed Studies course)		4

ELECTIVES		Credits
CV8100	Directed Studies: Engr	1
CV8102	Advanced Construction Mgmt	1
CV8105	Construction Admin and Mgmt	1
CV8106	Advances in Concrete Materials	1
CV8107	Special Topics: Civil	1
CV8110	Infrastructure Asset Management	1
CV8200	Proc for Wtr Pollution Control	1
CV8202	Surface Wtr Pollution Analysis	1
CV8204	Soil Remediation	1
CV8205	Spec Topics: Env Engineering	1
CV8207	Waste Management	1
CV8208	Hydroinformatics	1
CV8209	Bioenergy and Biofuels	1
CV8210	Environmental Impact Analysis	1
CV8211	Urban Water Systems	1
CV8300	Solid Mechanics	1
CV8301	Appl of Finite Element	1
CV8302	Dynamics of Structures	1
CV8303	Renov/Repair - Existing Struct	1
CV8304	High Perf Concrete Structures	1
CV8306	Durability of Structures	1
CV8307	Adv. Reinforced Concrete Design	1
CV8308	Bridge Design and Construction	1

CV8309	Spec Topics: Structural Engr	1
CV8311	Risk and Reliability for Eng	1
CV8312	Advanced Composite Structural Systems	1
CV8313	Prestressed Concrete	1
CV8317	Earthquake Engineering & Seismic Design	1
CV8318	Wind Engineering	1
CV8400	Road Safety	1
CV8405	Pavement Design and Mgmt	1
CV8406	Adv Highway Geometric Design	1
CV8407	Special Topics: Transportation	1
CV8409	Urban Transport Systems	1
CV8410	Travel Demand Analysis	1
CV8411	Non-Highway Transportation Systems	1
CV8412	Advanced Traffic Engineering Analytics	1
CV8500	Satellite Positioning	1
CV8501	Adv Geospatial Info Systems	1
CV8502	Digital Stereo Image Processing	1
CV8503	Geospatial Model and Visualiz	1
CV8504	Estimation and Data Series Analysis	1
CV8505	GIS for Civil Engineering	1
CV8506	Industrial Metrology	1
CV8507	Satellite Remote Sens: Urban	1
CV8508	Special Topics: Geomatics	1
CV8601	Adv Foundation Design	1
CV8602	Mechanized Urban Tunneling	1
CV8603	Modelling of Glacial Deposits	1
CV8604	Geotechnical Eng of Embankment Dams	1

COURSE LISTING

Master's Thesis
The student is required to conduct advanced research on a topic chosen in consultation with the student's thesis supervisor. The supervisory committee and the thesis supervisor must approve the thesis research plan/proposal, which is presented in writing by the student. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the research thesis, and the research results, to this committee. The examination committee will assess and grade the thesis. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

Master's Project
The Project may consist of an advanced design assignment, laboratory research project, analysis of research data, or an in-depth review of an approved aspect of the scientific literature. The student submits a written proposal of the project plan, which must be approved by the project supervisor, and the supervisory committee. The MEng candidate must submit two copies of the completed project report to the supervisor. An oral presentation of the project report, and results, will be arranged in a seminar format. The supervisor and another member of the supervisory committee will assess and grade the report. This is a "Milestone." Pass/Fail

PhD Candidacy Examination
This is a "Milestone." Pass/Fail

PhD Dissertation
Pre-requisite: Candidacy Examination. This is a "Milestone." Pass/Fail

Research Presentation: The student is required to present one or two oral presentation(s) on his/her research work in CV8010 (1)/CV8020 (2) before graduation. This is a "Milestone." Pass/Fail

CV8010 Master's Research Seminar
This course consists of weekly seminars emphasizing current research in specialized areas of Civil Engineering, including Environmental, Geomatics, Structural, and Transportation. This course will run through Fall and Winter semesters. Presentations will be given by MASc students, faculty members, visiting scholars and guest speakers. In order to achieve a pass grade in the course, the student must attend a minimum of 75% of the seminars in each of Fall and Winter semesters of his/her first year of

study. Following year one, the student will register in a research presentation milestone and present an oral presentation on his/her research work. Pass/Fail

CV8020 PhD Research Seminar
This course consists of weekly seminars emphasizing current research in specialized areas of Civil Engineering, including Environmental, Geomatics, Structural, and Transportation. This course will run through Fall and Winter semesters. Presentations will be given by Ph.D. students, faculty members, visiting scholars and guest speakers. In order to achieve a pass grade in the course, the student must attend a minimum of 75% of the seminars in each of Fall and Winter semesters of his/her first year of study. Following year one, the student will register in two research presentation milestones and present two oral presentations on his/her research work. Pass/Fail.

CV8100 Directed Studies in Engineering
Various possibilities exist for pursuing directed studies on topics approved by the course supervisor and thesis supervisor, including the other specialization course topics where they are not offered on a formal basis. 1 Credit

CV8102 Advanced Construction Management
This course aims to provide students with advanced management methodologies and decision-making tools, emphasizing analytical and quantitative approaches to managing complex construction projects in uncertain environments. Topics covered include project scheduling with time, resource and financial constraints, analytic hierarchy process, decision-making under uncertainty, game theory, Monte Carlo simulation, project risk management, and lifecycle infrastructure management. 1 Credit

CV8105 Construction Administration and Management
Topics on skills and techniques useful in administering and managing in a construction project environment, including international and Canadian construction, organizational design for projects and companies, management control structures and processes, meetings and negotiations, managing change in organizations, power struggles and politics in organizations, conflicts and their resolutions, claims and disputes in the industry, and the all-important issues of construction safety. 1 Credit

CV8106 Advances in Concrete Materials
Topics covered in the course will include: Chemistry and manufacturing of Portland cement; Supplementary cementing materials; Chemical admixtures for concrete; Properties of hardened concrete; Chemistry and mechanics of concrete deterioration and effects of SCM; Concrete of special properties; Advance experimental techniques in concrete.1 Credit

CV8107 Special Topics: Civil
The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course. 1 Credit.

CV8110 Infrastructure Asset Management
This course will discuss the framework, concepts, and methods of infrastructure asset management. Topics include system analysis, lifecycle costing, decision making under uncertainty, demand forecasting, performance measure and monitoring, inspection technologies, condition assessment, deterioration modeling and lifetime prediction, maintenance and rehabilitation optimization, prioritization and programming, innovative project delivery, and project and program management. 1 Credit

CV8200 Processes for Water Pollution Control
This course expands on the principles and designs involved in wastewater treatment. Topics cover physical, chemical, biological treatment processes, and advanced treatment methods including biological nitrification-denitrification, enhanced biological phosphorus removal, membrane bioreactors, biofilm processes, and alternative disinfection methods. A theoretical approach, supplemented by practical design applications and problem-solving, will be adopted. Antirequisite ES8902. 1 Credit

CV8202 Surface Water Pollution Analysis
This course will overview comprehensive water pollution prevention and control planning and provide quantitative modelling approaches and analyses of surface water pollution. Topics include: surface hydrology, municipal water use cycle, urban drainage systems, point and non-point pollution control strategies for sanitary, storm, and combined sewer systems, and key concepts in surface water quality modelling. Antirequisite: ES8906 .1 Credit

CV8204 Soil Remediation
This course overviews the design and operation of processes for soil remediation. Contaminants of interest include halogenated and non-halogenated volatiles, halogenated and non-halogenated semi-volatiles, flue hydrocarbons, pesticides and inorganics. Seven groups of technologies will be examined: (1) excavation and off-site disposal, (2) soil venting, (3) bioremediation, (4) thermal technologies, (5) chemical technologies, (6) mechanical flushing and washing, and (7) natural attenuation. Antirequisite ES8908. 1 Credit

CV8205 Special Topics in Environmental Eng.
The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course. 1 Credit

CV8207 Waste Management
This course describes the main issues in integrated solid waste management, waste transport and disposal. To know when solid waste is a resource, or a disposal problem requires its analysis and classification. Processing and handling of solid

waste, waste stabilization and solidification, land disposal of waste will be discussed. Physical conversion of waste including thermal, chemical, and biological conversion technologies will be described. Antirequisite: ES8904. 1 Credit

CV8208 Hydroinformatics
This course introduces the integration of water management with information and communication technologies in hydroinformatic concepts, methods and tools. Relevant systems analysis, modelling and decision support concepts are discussed in the context of current and future environmental challenges. The use of simulation models, optimization (single and multi-objective) techniques, machine learning, open data and data management are introduced and explained. 1 Credit

CV8209 Bioenergy and Biofuels
The course explores theories and applied technologies for production and conversion of biomass into energy and co-products, focusing on biomass waste for bioenergy and biofuel recovery with methane, hydrogen, and ethanol production. Biochemical processes (fermentation and anaerobic digestion) will be introduced and explained, followed by an overview of engineering tools applied to the analysis of energy conversion processes involving biomass thermochemical energy processes. 1 Credit

CV8210 Environmental Impact Analysis
The course will overview sustainable development and engineering and focus on the Canada Environmental Assessment Act and the Ontario Environmental Assessment Act. Topics include: sustainable development and engineering, concepts and methods of environmental impact assessment, physical/economic/social impacts, multi-objective evaluation of alternatives, cumulative impact assessment, and strategic environmental assessment. 1 Credit

CV8211 Urban Water Systems
Introduction to methods used for handling drinking water, wastewater and stormwater is presented through a brief history of water management in urban areas from ancient civilizations to present day. A review of key theories from hydrology and hydraulics is followed by a presentation of models used in analyses of urban water systems. The concept of integrated urban water management is introduced using case studies and associated tools. 1 Credit

CV8300 Solid Mechanics.
This course covers advanced mechanics of solids and elasticity while reviewing fundamentals of the mechanics of materials. Topics presented in this course include: Analysis of Stress, Strain and Material Properties, Problems in Elasticity, Failure Criteria, Bending of Beams, Torsion of Prismatic Bars, Numerical Methods, Stability of Columns, and Plastic Behavior of Materials. 1 Credit

CV8301 Appl.of Finite Element Meth.in Struct.Eng.
Application of stiffness method for trusses and frames. Direct formulation of CST and thermal-seepage. Finite element formulation by virtual work. Elements: triangular, Lagrangian and serendipity rectangles; numerical integration; curvilinear elements; three-dimensional elements; plates, shells and axisymmetric elements. Convergence: Rayleigh-Ritz method; patch test; reduced integration. Solution of special problems: 2D and 3D problems; secondary effects; non-linear problems; soil-structure interaction.
1 Credit

CV8302 Dynamics of Structures
Free-vibration. Damping in structures. Response to harmonic and periodic excitations. Response to arbitrary, step and pulse excitations. Numerical evaluation of dynamic response. Structural dynamics in International Building Codes. Floor vibration due to human excitation. Foundation design for machine vibration. 1 Credit

CV8303 Renovation/Repair of Existing Structures
Maintenance, renovation, rehabilitation and preservation of infrastructure. Mechanisms of mechanical, chemical and biological infrastructure degradation. Corrosion of steel condition surveys and evaluation of buildings and bridges repair and preservation of materials, techniques and strategies. Codes and guidelines. Case Studies. 1 Credit

CV8304 High Performance Concrete Structures
This course deals with the use of high performance concrete (HPC) in structures. Topics include: HPC principles, materials and mix design, early age properties, mechanical properties, producing and curing HPC, shrinkage problems, temperature effects, durability, constructability and sustainability, design issues, recent developments in HPC technology, emerging HPCs, HPC based structural elements and their design, case studies. 1 Credit

CV8306 Durability of Structures
Basic concepts, durability, safety, repair and strengthening. Deterioration mechanisms, corrective and preventive measures. Reliability analysis. Design for durability. Bridges. Parking structures. Steel, timber and masonry structures. Management systems. Strengthening and retrofitting. Case studies. 1 Credit

CV8307 Adv. Reinforced Concrete Design
Reinforced Concrete: Mechanics of reinforced concrete; truss model and compression field theory for beams failing in shear; design of two-way slabs; design of slender columns; shear friction and horizontal shear transfer; design for combined shear and torsion; design of deep beams and corbels. Antirequisite: CVL 904. 1 Credit

CV8308 Bridge Design and Construction
Types of bridges; material properties and design of timber, steel and concrete elements; bridge loads; load distribution in bridge superstructures; simplified methods of analysis, with reference to the Canadian Highway Bridge Design Code; design of slab bridges;

design of slab-beam bridges; design of box-girder bridges; joints, bearings, bridge piers and abutments. Antirequisite: CVL905. 1 Credit

CV8309 Special Topics in Structural Engineering
The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course. 1 Credit

CV8311 Risk and Reliability for Eng
The main purpose of this course is to present a comprehensive introduction to risk and reliability theory as it relates to modern engineering services. Starting with a review of probability and statistics, the course will cover structural reliability methods, reliability-based structural design, statistical methods for reliability and deterioration data analysis, stochastic modeling for inspection and maintenance, and engineering decision theory. 1 Credit

CV8312 Advanced Composite Structural Systems
This course equips students with advanced knowledge of modeling, analysis, design and construction of metal-skinned composite structural systems. Topics include: plain/profiled steel & new material plated panels/girders/composite elements; concrete filled composite beams/columns/frames; composite slabs; strengthening & durability; thin walled & sandwich construction; double skin steel-concrete composite elements & shear walls; innovative high performance composite systems & recent developments. 1 Credit

CV8313 Prestressed Concrete
Basic concept of prestressing including pretensioning and post-tensioning; Material properties of concrete and prestressing steel; calculation of losses; design procedure for members subjected to direct tension, flexure and shear; crack control; estimating short and long term deflections and design for anchorages. 1 Credit

CV8317 Earthquake Engineering & Seismic Design
This course covers the fundamentals of earthquake engineering pertinent to structural engineering. Topics presented include earthquake characteristics, structural response, structural modeling and analysis, and seismic design. Additionally, this course presents seismic design procedures for building structures. After completing this course, graduate students will be able to use seismic design codes and standards with ease and apply the knowledge acquired from this course both in practice and in research. 1 Credit

CV8318 Wind Engineering
In this course, students will learn how to apply wind engineering to quantify wind-induced loads and response of structures. This include: (i) climate analysis, (ii) modeling of terrain effect, (iii) modeling for aerodynamics using CFD or wind tunnel, (iv) Accounting for structural dynamics and (v) evaluation of equivalent static loads and structural responses. Students will also evaluate design wind loads using the NBCC and understand the limitations within the code. 1 Credit

CV8400 Road Safety
This course provides an understanding of the safety management process and the variety of science-based tools used. Topics include: probability and frequency models of crash occurrence; estimation of safety in developing and evaluating countermeasures; methods for identifying hazardous elements; safety of road facilities, including intersections, roadways, roadsides, and traffic control elements; driver, pedestrian and bicycle safety; applications of human factors principles; safety audits and in service road safety reviews; and alternative safety performance indicators. 1 Credit

CV8405 Pavement Design and Management
Pavement performance and distress. Theory and stress analysis of flexible and rigid pavements. Properties and characterization of paving materials. Design of flexible and rigid pavement for highways and runways. Overlay design. Reliability analysis. Flexible and rigid pavement construction. Pavement management systems. Review of design projects. Antirequisite: CVL 900. 1 Credit

CV8406 Advanced Highway Geometric Design
This course deals with the theory and practice of highway geometric design, including design controls, horizontal and vertical alignments, intersections, interchanges, and cross sections. Driver ability, vehicle performance, and safety are considered. Advanced topics such as three-dimensional sight distance, intersection control, safety audits, value engineering, design flexibility, design consistency, and reliability analysis are discussed. Other topics such as roundabout design and effect of autonomous driving on highway geometric design are also discussed. 1 Credit

CV8407 Special Topics in Transportation
The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course. 1 Credit

CV8409 Urban Transport Systems
The course teaches optimization and simulation methods to solve logistics and operations problems for urban infrastructure, including public transport systems, last-mile operations, traffic dynamics, CAVs, MaaS, and emergency response. It emphasizes methods to evaluate strategies in an urban setting complicated by density, multi-modes, high uncertainty, and ubiquitous data. Applications include transit network design, facility location problems, congestion pricing, and humanitarian logistics. 1 Credit

CV8410 Travel Demand Analysis
The travel demand analysis consists of developing behavioural models that can predict the individual mobility patterns in response to supply and demographic changes, level of service, and other external factors. This course will introduce data-driven as well as hypothesis-driven approaches that can mathematically model correlation, heterogeneity, dynamics, and latent behaviour with respect to travel related choice making. Furthermore, the use of such models in simulation to forecast the travel demand will be demonstrated. 1 Credit

CV8411 Non-Highway Transportation Systems This course covers basic concepts in the design, operations, and management of transportation systems other than highways. The systems are airports, ports, railways, and active transportation. Topics vary by system, but general topics include physical characteristics, design, capacity, safety, and management. The systems analysis approach, which is applicable to all systems, is discussed. Specific analytical tools are briefly described, including optimization, Monte Carlo simulation, and economic analysis. Practical case studies are discussed. 1 Credit

CV8412 Advanced Traffic Engineering Analytics The course is focused on the underlying theory and application of microsimulation and other related modeling approaches to explore the safety and operational implications of traffic engineering features for various road facilities. These applications include evaluation of intelligent transportation system treatments and investigating the implications for traffic operations and safety of connected and automated vehicles at various levels and degrees of penetration. 1 Credit

CV8500 Satellite Positioning
Overview of satellite positioning methods; geodetic concepts; description of satellite orbits; characteristics of the GPS/GNSS signals; GNSS observables; measurements errors; linear combination of GNSS observables; mathematical models for single site and relative positioning; single and multi-constellation GNSS; integer ambiguity determination; integration of GNSS and other systems; current research topics. 1 Credit

CV8501 Adv Geospatial Info Systems
This course covers such advanced topics as data models, structures and indexing; database management; geospatial analysis and modeling; geographic visualization; macro language programming and GIS software customization; distributed geospatial processing; standards and implementation issues. 1 Credit

CV8502 Digital Stereo Image Processing
Design characteristics of digital imaging systems for metric data capture; Geometric modeling and calibration of digital imaging sensors for high precision 3D data extraction; inclusion of various geometric constraints; solution approaches for multi-sensor networks; automation aspects of image correlation and feature extraction; image rectification procedures; applications in engineering deformation analysis; reverse engineering and medical imaging. 1 Credit

CV8503 Geospatial Modeling & Visualization
Remote sensing data collection and digital image processing techniques; Image quality assesssment and statiscal evaluation; Intensity transformation and spatial filtering, 3D visualization and modeling; Geospatial modeling and visualization of transportation and environmental models; Selected case studies in transportation, forestry, agriculture, and urban landscape. 1 Credit

CV8504 Estimation and Data Series Analysis
Overview of linearization and probability distributions. Least-squares estimation, batch and sequential estimation methods, constraints. Linear and nonlinear regression. Trend analysis. Concept and classification of stochastic processes, auto- and cross-correlation functions, and spectral density function. Some common stochastic models. Kalman filtering. 1 Credit

CV8505 GIS for Civil Engineering
Overview of basic concepts, methods and techniques of geospatial information systems. Application and related technologies of GIS for the planning, design, operations, and maintenance of civil engineering systems. GIS project design. Hands-on experience with GIS software and civil engineering examples/case studies. 1 Credit

CV8506 Industrial Metrology
Data acquisition systems employed for close range measurements. Close-range Photogrammetry and laser imaging. Mathematical formulations for self-calibration with geometric considerations. Bundle adjustment, DLT-type, sequential and phased methods. Photogrammetric network design and post-adjustment analysis. Processing of laser point clouds and form fitting. Industrial case studies. 1 Credit

CV8507 Satellite Remote Sensing of Urban Areas
Major topics include overview of high-resolution satellite remote sensors; Multi-sensor data fusion; Knowledge-based image analysis; Satellite images for object extraction; Intelligent change detection systems; Selected case studies in urban transportation planning, Land-use/land-cover mapping, and environmental impact analysis. A lab-based term project with a research report or paper is required. 1 Credit

CV8508 Special Topics: Geomatics
The subject matter changes from year to year. The course description will be announced prior to the scheduling of the course.
1 Credit

CV8601 Advanced Foundation Design
This course covers advanced topics on design of shallow and deep foundations, including subsurface investigation, foundation type and selection, design principle, bearing capacity and settlement of shallow and deep foundations, LRFD, and numerical simulation of foundation behavior using software . Antirequisite: CV8310. 1 Credit

CV8602 Mechanized Urban Tunneling
This course covers topics plan and design of mechanized tunneling in urban environments, including tunneling in urban environments, risk management and mitigation, tunnel alignment selection, TBM types and selections, support systems and design methods, settlement prediction and control, tunnel construction control, and numerical design of tunnel lining using software. Antirequisite: CV8315. 1 Credit

CV8603 Modelling of Glacial Deposits
Advanced soil mechanics course: nature and formation of glacial deposits; geotechnical investigation; laboratory and field testing and interpretation; effective stress and water in soil; stiffness of soil with particular reference to glacial deposits; yielding and failure of soil; critical state strength of soil; elastic-plastic model and Cam Clay model; softening-hardening model and numerical implementation of soil models. Antirequisite: CV8316. 1 Credit

CV8604 Geotechnical Eng of Embankment Dams
This course considers geotechnical engineering aspects of embankment dams, seepage and filter design, foundation design, monitoring, settlement and stability analyses, numerical simulation and prediction. 1 Credit

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COMMUNICATION AND CULTURE

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
CC8902	Research Methodologies	1
CC8905	MA Research Specialization and Practice	1
CC8906	CC: An Interdisciplinary Approach	1
Five credits from Group I, II or III: Specialization Electives (at least one from each of the groups)		5
AND one of the following Options:		
RESEARCH PAPER Option:		
Master's Research Paper		(Milestone)
And One additional credit from Group I, II or III		1
THESIS Option:		
Master's Thesis		(Milestone)
PROJECT Option:		
Master's Project		(Milestone)

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
Comprehensive Examination		(Milestone)
PhD Dissertation Research		(Milestone)
CC9900	Advanced Research Methodologies	1
CC9904	Perspectives: Comm and Culture	1
CC9906	PhD Field Seminar: Disciplinary Practice	1
AND Three credits from Groups I, II, or III: Specialization Electives		3

Group I: Specialization Electives in Media and Culture		**Credits**
CC8209	Media and Environment in the Digital Age	1
CC8211	History of Things	1
CC8213	Space and Cinema	1
CC8822	Performing Arts in the City	1
CC8826	Post-Human Cndn: Theory, Polit	1
CC8828	Philosophy, Culture and Values	1
CC8829	Modernist Lit Circ: Cult'l Appr	1
CC8833	Cultures of Sexuality, Gender	1
CC8834	Images of Animals	1
CC8836	Topics in Media and Culture	1
CC8837	Asian Studies: Critical Perspectives	1
CC8838	Postcoloniality	1
CC8839	Sound Studies	1
CC8920	Theoretical Appch Media & Cult	1
CC8921	Visual Culture	1
CC8922	Issues in Cultural Studies	1
CC8924	Marxism, Culture and Film	1
CC8925	Reading Television	1
CC8927	Reading Film	1
CC8930	Cult & Values - Pop Media	1
CC8931	Popular Music Studies	1

CC8932	Commun Culture and the City	1
CC8934	Contemp Topics: Social Theory	1
CC8935	Critique of Everyday Culture	1

Group II: Specialization Electives in Politics and Policy		**Credits**
CC8310	World Politics and Popular Culture	1
CC8702	Labour in Comm and Culture	1
CC8840	Media Democracy	1
CC8841	Owning Culture	1
CC8844	Managing the Broadcast and Digital Worlds	1
CC8847	Global Media	1
CC8848	Armed Conflict, Peace and the Media	1
CC8849	Topics in Politics and Policy	1
CC8850	Politics of Aesthetics	1
CC8940	Poltc Econ of Cult and Commun	1
CC8941	Issues in Commun & Cult Policy	1
CC8947	Cultural Policy	1
CC8949	The Communications Industry	1
CC8950	Current Issues: Telecommun	1
CC8952	Political Economy of Media	1
CC8953	Politics of Intellec Property	1
CC8954	New Social Movements	1
CC8959	Spec Topics: Politics & Policy	1

Group III: Specialization Electives in Technology in Practice		**Credits**
CC8401	Accelerating Technicity	1
CC8703	Tech Mediations in Visual Culture	1
CC8832	Communicatn and the Sociotech	1
CC8860	Digital Games and Learning	1
CC8861	Bodies in Technology	1
CC8862	Future Cinema II	1
CC8863	Media History: Concepts and Case Studies	1
CC8960	Adv Communication Technology	1
CC8962	Lang & Narrative Film/Video/Mm	1
CC8963	Social Cult Impl of New Media	1
CC8966	Activist Video Making	1
CC8967	Contemp Theory in Visual Arts	1
CC8969	Media Ethics	1
CC8975	Race and Gender in Digital Technology	1
CC8979	Selected Topics in Technology and Commun.	1
CC8982	The Body and the Culture of Modernity	1
CC8983	The Culture of the Avant-garde	1
CC8984	A History of News	1
CC8985	Photographic Vision/Practice	1
CC8986	Future Cinema	1
CC8987	Selected Topics, Tech in Pract	1
CC8988	Design, Theory and Criticism	1
CC8989	Design Issues and Critical Making	1
CC9921	Technology Commun & Culture*	1
CC9922	Cinema and Media Studies: Key Concepts*	1

*Doctoral level only

The following courses may be used by Master's students in place of any Specialization course, with the permission of the Program Director.		**Credits**
CC8990	Directed Rdg: Commun & Cult A	1
CC8991	Directed Rsrch: Commun & Cult	1
CC8992	Directed Grp Stud: Comm & Cult	1
CC8993	Field Placements	1
CC8994	Directed Rdg: Commun & Cult B	1
CC8093	Field Placements	2
CC9901	Selected Topics in Research Methods	1

The following courses may be used by Doctoral candidates in place of any Specialization course, with the permission of the Program Director.		**Credits**
CC9901	Selected Topics in Research Methods	1
CC9990	Directed Readings A	1
CC9991	Directed Readings B	1
CC9992	Directed Research	1
CC9993	Directed Group Study	1

COURSE LISTING

All “CC” courses have York University course numbers indicated in brackets following the Ryerson University codes.

Master's Research Paper
This is a “Milestone.” Pass/Fail

Master's Thesis
This is a “Milestone.” Pass/Fail

Master's Project
This is a “Milestone.” Pass/Fail

Comprehensive Examination
This is a “Milestone.” Pass/Fail

PhD Dissertation Research
Pre-requisite: Comprehensive Examination. This is a “Milestone.” Pass/Fail

CC8209 Media and Environment in the Digital Age
This course engages with current questions in the field of media and environment, providing a broad overview of key schools of thought and historical approaches to environmental communication and media. Topics covered include: environmental impacts of digital media and media industries; environmental soundscapes and environmental sensing; Indigenous cosmologies; and mediating environmental justice. 1 Credit

CC8211 (CMCT 6133 3.0) History of Things
This course explores critical debates and interdisciplinary research methods employed in the study of material objects. It draws on case studies and theoretical work on material culture, display, and representation to consider the influence of the ‘material turn’ on contemporary scholarship and on historical and curatorial practices. Antirequisite: HUMA 6333, HIST 5740 (York University)1 Credit

CC8213 (CMCT 6132 3.0) Space and Cinema
Examines a variety of ways that space is created and experienced in film, television and video art with a consideration of themes such as the spaces of production and exhibition, location shooting and realism, cultural industries and real estate, special effects and virtual spaces, cognitive maps and habitus, and moving images as monuments. Featured theorists include Walter Benjamin, Siegfried Kracauer, Henri Lefebvre, Andre Bazin, the Situationists, Fredric Jameson, Laura Mulvey, Jean Louis Baudry, Stephen Heath, Paula Massood and David Harvey. Antirequisite: FILM 6242 or SPTH 6322 (York University). 1 credit

CC8310 (CMCT 6326 3.0) World Politics and Popular Culture
Popular culture in its many forms both reproduces and critiques received versions of world politics. This course explores the intersections of popular culture and world politics to ask what are the analytic and political possibilities of these sites. Antirequisite: GS/POLS 6221 3.00 (York University). 1 credit

CC8401 (CMCT6527 3.0) Accelerating Technicity
Accelerating Technicity examines the concept of technology in select works of Heidegger, Marcuse, Deleuze, Simondon, Stiegler, Hayles, Virilio and Acclerationism. Using these theorists the course will grapple with Heidegger's two conflicting tendencies in technology: the dominant tendency of instrumental technology (the danger inherent in technology) and

second, the tendency toward poeisis (the revealing and saving potential inherent in technology). Antirequisites: GS/SPTH 6155 3.00, GS/POLS 6088 3.00 York University)Antirequisite: SPTH 6155 (York University) 1 Credit

CC8700 Intro. to Theories of Commun. & Culture
An intensive introduction to the major theories of communication and culture. The course will provide an overview of the major themes and thinkers in the area. Antirequisite AKCEFG4000 3.0 (York University).This course is a non-degree/non-credit course designed to provide background training and may be required of some students as conditions of admissions. 1 Credit

CC8701 Understanding Commun. Technologies
An intensive introduction for non-specialists to the history of communication technology and to the operation and uses of contemporary and emerging forms. Use of lecture, seminar and studio/lab demonstrations will provide the participant with opportunities to connect technology theory and practice. Antirequisite CDGS701 (Ryerson University, Continuing Education).
This course is a non-degree/non-credit course designed to provide background training in current communication and media production and delivery technologies and may be required of some students as conditions of admissions. 1 Credit

CC8702 (CMCT 6325 3.0) Labour in Communication and Culture
This course reviews the theoretical and historical constitutions of labour in relation to communication and culture as it has been articulated as a distinct field of inquiry, and as evident in practices and institutions. (York University) 1 Credit

CC8703 (CMCT 6539 3.0) Tech Mediations in Visual Culture
This course examines the interconnectedness of representation and visual culture in contemporary wired society. Students will critically explore and assess the influence and shaping of technological mediations in visual culture investigating theory, culture, globalization, and education. Antirequisite: EDUC 5856, ARTH5185 (York University) 1 Credit

CC8822 (CMCT 6112 3.0) Performing Arts in the City
This course examines the impact of the performing arts on local communities. Antirequisites: GS/THST 6315 3.00, GS/MDES 5601 3.00 (York University) 1 Credit

CC8826 (CMCT 6321 3.0) The Post-Human Cond'n.: Theory & Politics
Since the 1990's "cyber" has altered what it means to be human in terms of self and other, essence, agency, consciousness, intimacy, intelligence, reason, life, embodiment, identity, and gender. This course examines the meaning, possibilities, and implications of the posthuman. 1 Credit

CC8828 (CMCT 6111 3.0) Philosophy, Culture & Values
This course explores philosophical concepts that we rely on as meaningful in communication. It introduces students to metaphysical concepts and gives students a chance to explore how much of our world relies on shared metaphors in the struggle to communicate. 1 credit

CC8829 (CMCT 6126 3.0) Modern Lit Circ: Cult'l Appr
Course studies culture of early twentieth-century modernist salons in New York, Paris, and London with focus on New York Dada, Left Bank Moderns, and Bloomsbury. Course explores a range of cultural expressions (print culture, visual culture and performance). More specifically, students investigate synergies of different media and nationalities and probe interrelationship among various artists; students also examine relationship of space including interior design and architecture in formation and flourishing of modernist salons and literary circles. 1 Credit.

CC8832 (CMCT 6523 3.0) Communication and the Sociotechnical
This course investigates some of the texts in the burgeoning study of society and technology that have inspired its major philosophical perspectives and frameworks of research. Socio-cultural inquiry into new communication and information technologies frequently invokes one or another perspective grounded (selectively) in these texts; this course instead focuses on systematic comparison of the several distinct perspectives that characterize this area of study, with particular attention to their deployment in communication and culture research. Six perspectives are surveyed in six modules of instruction: Institutionalism, Critical Theory, Feminism, Phenomenology, Social Constructionism, and Actor-Network Theory. 1 Credit

CC8833 (CMCT 6123 3.0) Cultures of Sexuality and Gender
This course surveys theoretical approaches to cultures of sexuality and gender in relation to diverse media. Using feminist, queer, constructionist, posthumanist, and other approaches, the course develops students' techniques of historicization and skills in analysing current debates in the field. 1 Credit

CC8834 (CMCT 6127 3.0) Images of Animals
Referring to literary and media sources, as well as historical, cultural and scientific texts, the course examines the creation, development and consequences of varied perspectives on non-human animals and on the viability of animals in a world dominated by humans. Antirequisites: GS/HUMA 6308 3.00, GS/FILM 5320(n) 3.00 (York)1 Credit

CC8836 (CMCT6135 3.0) Selected Topics in Media and Culture
The list of topics for discussion is flexible, depending upon the interests and preparation of students from year to year and the specialty of the course director. This course is designed to provide opportunities for post-doctoral fellows, visiting scholars and SGS (or FGS York) appointed faculty to teach specialty courses in the field of Media and Culture. 1 Credit

CC8837 (CMCT 6136 3.0) Asian Studies: Critical Perspectives
This course offers a historical examination of the multiple, overlapping processes through which Asian identities and regions were constituted. It will also examine new directions in Asian studies in an era of intensified global flows, transnationalism, and the presence of Asian diaspora in Canada and elsewhere. Antirequisites: GS/SOCI 6745 3.00, GS/HUMA 6135 3.00, GS/ANTH 5500 3.00, GS/HIST 5480 3.00, GS/GEOG 5700 3.00 (York)1 Credit

CC8838 (CMCT 6137 3.0) Postcoloniality
The course investigates Postcolonialism as a field within Cultural Studies. Emphasizing socio- and politico-cultural analyses, themes such as colonial discourse, orientalism, hybridity, resistance, subalternity, indigeneity, Eurocentrism, cultural imperialism, language, race, sexuality, gender, and subjectivity are examined through a range of interdisciplinary and conceptual perspectives. Texts containing influential theoretical arguments are the primary focus, with some works from the Arts also featured. 1 Credit

CC8839 (CMCT 6119 3.0) Sound Studies
This course aims to introduce graduate students to the diverse and interdisciplinary field of "sound studies." We will read sound studies scholarship produced by academics and artists/practitioners in recent years as well as going back to one or two "seminal" texts in the field. The goal of the course is to provide students with a broad introduction to the range of scholarship in the field rather than focus on one particular disciplinary or methodological approach. 1 Credit

CC8840 (CMCT 6314 3.0) Media Democracy
This course examines the central role of the news media in a democratic society, with an emphasis on Canada. The constraints on media democracy, exploring various media from newspapers to the internet and attempts to address the lack of media democracy will be explored. 1 Credit

CC8841 (CMCT 6318 3.0) Owning Culture
This course identifies and examines central issues in the management of public and private television enterprises in Canada, and online programming undertakings. Students will analyse the current environment and the scenarios for the future of Canadian broadcasting; they will also investigate how broadcasters, programmers and producers are managing content and revenue on both traditional and digital platforms and in new partnerships. Antirequisite: SB/ARTM 6340 3.00 (York)1 Credit

CC8844 (CMCT 6340 3.0) Managing the Broadcast and Digital Worlds
This course identifies and examines central issues in the management of public and private television enterprises in Canada, and online programming undertakings. Students will analyze the current environment and the scenarios for the future of Canadian broadcasting; they will also investigate how broadcasters, programmers and producers are managing content and revenue on both traditional and digital platforms and in new partnerships. 1 Credit

CC8847 (CMCT 6319 3.0) Global Media
This course examines global media from an historical and critical perspective. Broadcasts, publications, films and digital productions are viewed as transnational communication channels which have a decisive impact on contemporary life. 1 Credit

CC8848 (CMCT 6322 3.0) Armed Conflict, Peace and the Media
Focusing on periods of armed conflict, the course analyzes the nature and extent of corporate and government ownership or control of communication, the representations of social relations and competing discourses of war, terrorism and peace, practices of journalism and media activism, and the role and responsibilities of content producers during such time. 1 Credit

CC8849 (CMCT 6335 3.0) Selected Topics in Politics and Policy: The list of topics for discussion is flexible, depending upon the interests and preparation of students from year to year and the specialty of the course director. This course is designed to provide opportunities for post-doctoral fellows, visiting scholars and SGS (or FGS York) appointed faculty to teach speciality courses in the field of Politics and Policy. 1 Credit

CC8850 (CMCT6336 3.0) Politics of Aesthetics
The Politics of Aesthetics develops an aesthetic framework from eight Continental philosophers who have an aesthetic theory as part of their philosophy. The philosophers include Hegel, Heidegger, Badiou, Ranciere, Bataille, Baudrillard, Virilio and Deleuze. These are selected because their philosophy facilitates the artwork surpassing the aesthetic theory. Antirequisites: GS/POLS 6087 3.00, GS/SPTH 6648 3.00 (York University) 1 Credit

CC8860 (CMCT 6537 3.0) Digital Games and Learning
This course examines play as it is currently developed and popularly imagined in commercial computer- and consoled-based games in order to more closely examine what is "learned" in those immersive environments and ask how they might more productively be harnessed for educative ends. Antirequisite: EDUC 5863 (York University) 1 Credit

CC8861 (CMCT 6538 3.0) Bodies in Technology
This course explores the ways in which technological representations of the body are reshaping the boundaries between technical and biological, thus giving rise to 'new' conceptualizations of the embodiment, identity and agency. Antirequisite: STS6200 (York University) 1 Credit

CC8862 (CMCT6508 3.0) Future Cinema II: Applied Theory
This hands-on course gives students an opportunity to learn about new screen technologies, approaches and techniques in a lab environment. Students will work in the lab to build prototypes that will function as a testing ground for both new technology and future cinema theory. Our method is iterative: there is an urgent need for scholars in this field to be both theorists and practical experimenters, to research while doing. Antirequisite: FILM 5246 (York University). 1 Credit

CC8863 (CMCT6526 3.0) Media History: Concepts and Case Studies
Provides an in-depth exploration of the challenges and possibilities of historical research on forms of media. Antirequisite: GS/HIST 5730 3.00 (York University) 1 Credit

CC8902 (CMCT 6002 3.0) Research Methodologies
Students in the core courses are required to attend a workshop on research methods in communication and cultural studies. These sessions are designed to complement the theoretical materials presented in the core seminars and will provide an overview of the range of research methods in communication and cultural studies. The course introduces students to a wide range of methods and approaches, including research design (qualitative and quantitative), survey research, content analysis, textual analysis, discourse analysis, historiography, legal and documentary research, ethnographic techniques, cultural studies approaches and others. Masters Core Course. 1 Credit

CC8905 (CMCT 6005 3.0) MA Research Specialization and Practice
This combination lecture/seminar course consolidates graduate coursework and bridges the transition to independent critical research. It assists and evaluates the student in developing professional skills including: peer review, grant-writing, formal presentations, conference and publication's submission which may include applied research in submissions to government or organizational policy papers, and public forums or hearings on communication and culture. Antirequisite: CC8903. 1 Credit.

CC8906 (CMCT 6004 3.0) CC: An Interdisciplinary Approach
This course introduces a critical approach to the three symbiotic areas of the program at the graduate level: media and culture; politics and policy, and technology in practice: applied perspectives. The course will explore each area in modules that concentrate on four aspects: history; philosophy; theory; and principle concepts or issues, with one week dedicated to each aspect in each area.
Antirequisite: CC8900, CC8901. 1 Credit.

CC8920 (CMCT 6100 3.0) Theoretical Approaches to Media & Culture
This course reviews central issues in the study of media and culture through an examination of the ways in which mediations of social identity (e.g. class, gender, race, sexuality, nationality), act as highly selective and ideologically shaped portrayals of the social order. The course is built around a number of current and "classical" theories which allow particular insight into the articulations of representation (discursive, imagistic, visual) with human identity, subjectivity and selfhood. These theoretical frames of reference are also applied in the analysis of various media forms and genres., including text, photography, television, film and the built environment. (Foundation Course). Antirequisite: POLS 6055 3.0 (York University). 1 Credit

CC8921 (CMCT 6110 3.0) Visual Culture
The course will begin by exploring the ways in which we have been taught to analyse and understand images, and how to produce and reproduce them. The course aims, however, to move beyond analysis of specific texts in order to historicize and understand the larger cultural meanings that have been assigned to the visual. We will attempt to come to terms with what W. J. T. Mitchell has called the "pictorial turn" in all its complexity. The course includes works by philosophers and cultural theorists as well as poets, painters, novelists, videographers, filmmakers, and cyberneticists. 1 Credit

CC8922 (CMCT 6101 3.0) Issues in Cultural Studies
This course is an advanced examination of the contribution of cultural studies perspectives to the study of communication and culture, with emphasis on contemporary problems and theories. 1 Credit
Note: This course will focus on the needs of PhD students. MA students with appropriate background will be admitted with permission.

CC8924 (CMCT 6095 3.0) Marxism, Culture and Film
This course examines the Marxist tradition in cultural and aesthetic theory and practice. It considers selections from the philosophical and aesthetic writing of Marx and Engels and later Marxists like Lukacs, Gramsci, Lenin and Trotsky and goes on to consider the Frankfurt School, James, Debord, Althusser, Williams, Jamieson, Said and Eagleton, among others. Theoretical and creative work by major artists like Brecht, Eisenstein, Godard and Alea will be discussed. Selected important debates and controversies about Soviet culture, the role avant-gardes, realism and socialist realism, cultural imperialism and colonialism, feminism, modernism and postmodernism will be discussed. Specific discussions will focus on analysis and practice related to the Marxist and socialist tradition in film, selected from the Soviet 20s, Renoir and the French Popular Front, the Hollywood Reds, Italian neo-realism, Godard and May '68 and the Third Cinema of the "third world". Antirequisite: GS/POLS 6095 3.00, GS/FILM 6320(J) 3.00 (York University). 1 Credit

CC8925 (CMCT 6104 3.0) Reading Television
Fundamental to contemporary cultural studies is recognition that the meaning, form and value of cultural products such as situation comedies, soap operas, advertisements, cannot be separated from the social context in which they are produced and received. The course will explore such questions as: What are the genre conventions? How do different individual communities use and value television products? To what extent do television products promote resistance and change and to what extent do they preserve the status quo? Students will apply several frameworks to selected products in order to analyse how the products work in relation to individuals and communities. 1 Credit

CC8927 (CMCT 6096 3.0) Reading Film
The course examines screen representation of gender as expressivity and enactment, from a historical, sociological, and critical perspective focusing largely on dramaturgy. Relevant approaches are introduced and a focused study of films and theoretical issues of choice is enabled. 1 Credit

CC8930 (CMCT 6105 3.0) Culture and Values in Popular Media
This course examines the rights, freedoms and social obligations of the media, with special attention to content producers and disseminators, both private and public. The issues of freedom of expression and its limits, access to information, privacy, and accountability are highlighted. The role of audiences as citizens, consumers and potential producers of content is also examined. 1 Credit

CC8931 (CMCT 6106 3.0) Popular Music Studies
The phenomenon of popular music is investigated from a number of perspectives through a survey of scholarly and popular vernacular literature. Issues in popular music, including paradigms for analysis and interpretation are examined. Antirequisite MUSI 6320 3.0 (York University). 1 Credit

CC8932 (CMCT 6114 3.0) Communication, Culture and the City
This course will inquire into social forms and practices of city life by examining and applying theories and methods from the social sciences, humanities, and fine arts. The course will seek to engage in an intellectual relationship between the city and culture with a particular focus on concepts of space, urbanity, communication, and memory. Requisite: Communication and Culture students only. 1 Credit

CC8934 (CMCT6113 3.0) Contemporary Topics in Social Theory
The purpose of this course is to take up issues that are topical and require some knowledge of social, political, philosophical and psychoanalytic theory. Antirequisite: SOCI 6220 3.0 (York University), SPT 6043 3.0 (York University), PHIL 6640 3.0 (York University) 1 Credit

CC8935 (CMCT 6121 3.0) The Critique of Everyday Culture
An attempt to integrate various theoretical frameworks centering on the twin problematics of everyday life and the study of popular culture. In particular, it examines anthropological, phenomenological, semiological, hermeneutical and neo-Marxist approaches to culture. Antirequisite: SOCI 6130 3.0 (York University), SPT 6609 3.0 (York University) 1 Credit

CC8940 (CMCT 6300 3.0) The Political Econ. of Culture & Commun.
This course reflects the theoretical perspective that communication systems and cultural practices shape and are shaped by the social distribution of power in all societies. It examines the role of the state, the market civil society in the production and distribution of cultural products and the implications of their relationships for society. (Foundation Course) 1 Credit

CC8941 (CMCT 6301 3.0) Issues in Communication & Cultural Policy
This course focuses on specific issues that are shaping communication and cultural policy, including the emergence of the "information highway," globalization and convergence. (Foundation Course) 1 Credit

CC8947 (CMCT 6306 3.0) Cultural Policy
This course examines the relationship between cultural and social policy in Canada through the study of historical and contemporary examples. In so doing, focusing on arts policies, the course will examine the historical development of policy and the formulation and execution of municipal, provincial and federal policies in Canada. The course will have a research orientation and will focus in particular on current issues in arts and cultural policy and strategies for the future. Where appropriate, comparative analyses will examine other policy models with special reference to Europe, Britain, and the United States. Antirequisite: ARTM 6300 3.0 (York University). 1 Credit

CC8949 (CMCT 5303 3.0) The Communications Industry
This course is designed to provide a perspective on the Canadian information technology and telecommunications industry, in international context. It provides an in-depth understanding of the structure and dynamics of voice, data, video, internet, wireless, hardware and content markets. It explores the current environment, trends, and major players, including their strategies and prospects. Antirequisite: AIM 307. 1 Credit

CC8950 (CMCT 5304 3.0) Current Issues in Telecommunications
This course explores emerging issues of interest to telecommunications and information technology analysis, managers, and policy-makers. It assumes a basic understanding of the technology and industry and features presentations by leading experts in regulations, technology, and emerging issues. Antirequisite: AIM 407. 1 Credit

CC8952 (CMCT 6310 3.0) Polit.Econ.of Media: Tech/Polit/Global
The course examines the profound transformation of the media industries by new technologies and market applications, such as satellite television, the Internet, and the digital revolution. These technological and commercial forces have destabilized national media landscapes, especially where government policies and regulations have attempted to protect and promote domestic cultural and communications industries. The course examines the emergence of transnational commerce actors in the media industries and their impact on political arrangements. Canada is discussed in comparative perspective. 1 Credit

CC8953 (CMCT 6308 3.0) The Politics of Intellectual Property

The expansion of intellectual property rights (IPRs) has become a major area of international controversy and global resistance as these properties come into conflict with broader public interests and violate human rights. The course explores the new regimes of trade that are expanding the privatization of more and more areas of human life, the political and social consequences of these expanded rights and struggles involving farmers, feminists, developing countries and indigenous peoples to protest and contain these rights. 1 Credit

CC8954 (CMCT 5307 3.0) New Social Movements
Examination of new social movements that have arisen in response to the crisis of industrial culture, economic restructuring, shifting political formations, and ecological disasters. The focus is on current theories of social movements in action. Opportunities for students to gain first-hand experience with social movement organizations through participatory research projects are provided. Antirequisite: ENVS 5073 3.0 (York University), ENVS 4161 3.0 (York University). 1 Credit

CC8959 (CMCT 6309 3.0) Special Topics in Politics and Policy
Under this rubric, program faculty members propose limited duration courses arising from major research projects or current issues. 1 Credit

CC8960 (CMCT 6500 3.0) Advanced Communication Technology
This course is an exploration of the major current issues for communication and culture raised by contemporary and emerging communication technologies and their applications. The course encompasses theoretical and applied perspectives. (Foundation Course) 1 Credit

CC8962 (CMCT 6503 3.0) Language & Narrative in Film/Video/Mm
Each medium has its own conventions for creating meaning. New interactive media demand new approaches to creating meaning. This course examines the evolution of language and narrative from a theoretical and practical perspective. 1 Credit

CC8963 (CMCT 6504 3.0) Social and Cult. Implications of New Media
This course focuses on the changes brought about by changes in communication technology for individuals, groups and organizations, and the challenges and opportunities presented by them. 1 Credit

CC8966 (CMCT 6516 3.0) Activist Video Making
From the earliest of times, the potential of using film and video to animate, agitate and educate has attracted committed film and video-makers. Participants in this course will be involved in the collaborative production of short community-based video works focused on selected social and political issues. The course will also include an historical overview of documentaries made by film and video makers engaged in radical production, post-production and distribution practices. Antirequisite: FILM 5320 3.0 (York University) 1 Credit

CC8967 (CMCT 5501 3.0) Contemporary Theory in the Visual Arts
The course contextualizes the contemporary structuralist, psychoanalytical feminist, Marxist, and postmodernist theory with respect to the history and development of specific art practice in the visual arts and its relationship to society. The relationship between contemporary critical theory and artistic production will be addressed through an examination of prescribed reading and examples of works drawn from the visual arts, film, video, new media and performance. This examination incorporates an analysis of French, British and North American sources together with debates, artistic productions, and explorations by contemporary artists. Antirequisite: VISA 5600 3.0 (York University). 1 Credit

CC8969 (CMCT 5503 3.0) Media Ethics
An examination of the rights, freedoms, and obligations of the media and of practicing journalists. The course deals with such issues as the grounds and limits of freedom of expression, moral responsibilities respecting truth, balance, and objectivity; ethical and business pressures in media; obligations to the public, the audience, sources, colleagues, employers, and oneself. The course includes case studies and discussion of ongoing media activity. Antirequisite: PHL 530. 1 Credit

CC8975 (CMCT 6511 3.0) Race and Gender in Digital Technology
In recent years, corporate leaders, government officials, and media pundits have portrayed the western restructured socio-economic near-future as a “digital” one, forefronting the centrality of digital technology and the digitization of information to the social, economic, and political changes currently sweeping Canada, as well as the rest of the OECD. We will examine the ways in which race and gender manifest in the discourses, policy decisions and representations of digital technology in Canada. GS/FILM 6320H 3.00 (York University) 1 Credit

CC8979 (CMCT 6509 3.0) Selected Topics in Technology and Commun.
Under this rubric, program faculty members propose limited duration courses arising from major research projects or current issues. 1 Credit

CC8982 (CMCT 6118 3.0) The Body and the Culture of Modernity
The body is a site of contested meaning, and has attracted the efforts of artists, designers, and people themselves, committed to some form of cultural critique. Critical theorists of gender, race, haptics, technology, affect, and sensuality have variously

conceptualized the culturally-constructed body as a site of intersectional emancipation against the normative uniformed code of gendered beauty, comfort, and desire. This course will survey selected themes to assess political, aesthetic and cultural implications. 1 Credit

CC8983 (CMCT 6117 3.0) The Culture of the Avant-garde
In this course we survey a number of avant-garde art movements of the twentieth century. We first consider the cultural paradigm that these various artistic movements reacted against, the paradigm known as modernity. We then examine various vanguard artistic movements of the twentieth-century as expressions of discontent with the culture of modernity. We do this partly through selected readings in cultural theory; however, the principal source of information will be the manifestos the various movements issued. 1 Credit

CC8984 (CMCT 6519 3.0) A History of News
This course studies the evolution of news as a historical phenomenon. It focuses on the various forms which news has taken at different periods and in different places; on how these forms have been influenced by changing technology, business organization, and markets; on how different audiences have responded to news; and on how the producers of news have understood their role in relation to their society, their audiences, their employers and their peers. GS/HIST 5029 3.00 (York University) 1 Credit

CC8985 (CMCT 6515 3.0) Photographic Vision/Practice
The importance of photographic imagery in history, culture, media and communication is widely acknowledged but is for the most part unexamined. This course proposes an investigation into the materials and methods of photographic image-making, combined with a survey of key critical writings and the contemporary theories about photographic representation that grow out of these. This dual investigation will be supplemented by independent research and writing undertaken by each student. Critical texts will balance writings of practicing photographers (Paul Strand, Gisele Freund, Henri Cartier-Bresson, Robert dams) with those of critics and theorists (Walter Benjamin, Jean Beaudrillard, Alan Sekula, Susan Sontag); in addition, several contemporary anthologies (by Richard Bolton, Vicki Goldberg, Liz Wells) will also provide source material. 1 Credit

CC8986 (CMCT 6507 3.0) Future Cinema
This course examines the shift from the traditional cinematic spectacles to works probing the frontiers of interactive, performative, and networked media. Drawing upon a broad range of scholarship, including film theory, communication studies, cultural studies and new media theory, the course will consider how digital technologies are transforming the semiotic fabric of contemporary visual cultures. GS/FILM 6245 3.00, GS/HUMA 6245 3.00 (York) 1 Credit

CC8987 (CMCT 6535 3.0) Selected Topics in Technology in Practice: The list of topics for discussion is flexible, depending upon the interests and preparation of students from year to year and the specialty of the course director. This course is designed to provide opportunities for post-doctoral fellows, visiting scholars and SGS (or FGS York) appointed faculty to teach speciality courses in the field of Technology in Practice. 1 Credit

CC8988 (CMCT 6524 3.0) Design, Theory and Criticism
Overview of key theories and themes that form the foundation of contemporary critical design studies. Drawing on theories from a broad range of disciplines, this course employs close readings of selected texts and works to explore design as a product, a practice, and a mode of social communication. Specific topics may vary with the Instructor. Antirequisite: GS/DESN 5101 3.00, GS/ARTH 5101 3.00 (York University). 1 Credit

CC8989 (CMCT 6525 3.0) Design Issues, Critical Making
This course explores definitions of Design/design, and issues generated by and reflected in design as a response to technological innovation, changes in business models, and social and global environments in the age of social media. It encourages students to bridge critical theories and making as a part of the designing process and as an empowering tool for communication in the public space. Antirequisite: GS/MDES 5102 3.00, (York University). 1 Credit

CC8990 (CMCT 6911 3.0) Directed Readings in Commun. and Culture A
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's program objectives. 1 Credit

CC8991 (CMCT 6902 3.0) Directed Research in Commun. and Culture
The directed research course is intended to permit the student to conduct research or develop a theoretical perspective in an area of study related to the student's program objectives. The research may take the form of a pilot study for a thesis or dissertation project. 1 Credit

CC8992 (CMCT 6903 3.0) Directed Group Study in Commun. and Culture
The directed group study is intended to allow a group of students, with the agreement of a faculty member, to organize a seminar in an area not covered in the course offerings. 1 Credit

CC8993 (CMCT 6909 3.0) Field Placements
Master's students are able to receive credit for a one term course by undertaking a field placement in an appropriate institution. 1 Credit

CC8994 (CMCT 6911 3.0) Directed Readings in Commun. and Culture B
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's program objectives. 1 Credit

CC9900 (CMCT 7200 3.0) Advanced Research Methodologies
The principal aim of this course is to cultivate a critical research sensibility that addresses questions of communication and culture and their intersection, with research being defined as an engaged process of enquiry and discovery that leads to the production of

social knowledge. Different models of reality will necessarily lead to (1) different propositions about what communicational reality is, and with this (2) different ways of establishing what can be accepted as real, (3) different ways of justifying the data relevant to reality, and (4) different strategies for collecting such data. Doctoral Course. 1 Credit

CC9901 (CMCT 6922 3.0) Selected Topics in Research Methods
Develops knowledge and skills of selected advanced research methods topics. The list of topics for discussion is flexible, depending upon the interests and preparation of students from year to year and the specialty of the course director. Corequisite: CC8902 (CMCT60023.0) or CC9900 (CMCT72003.0)

CC9904 (CMCT 7000 3.0) Perspectives in Commun. & Cultural Studies
[formerly Advanced Theories in Communication & Culture I] This course provides an advanced exploration of the major theories and research approaches in the field, with particular attention to a critical assessment of contemporary theories and methods. The first segment of the course will introduce students to those classical theorists and philosophers whose work was taken up and developed by more recent studies in the late twentieth century. It therefore deliberately anticipates issues that were subsequently developed so that students may be equipped to decide in the second part of the course which themes are relevant or irrelevant to the study of communication and culture. Doctoral Course. 1 Credit

CC9906 (CMCT 7005 3.0) PhD Field Seminar: Disciplinary Practices
This seminar facilitates independent doctoral research by developing skills of disciplinary rigour in relation to individual research interests. It provides guidance in the advancement of field and area specialties in preparation for comprehensive qualifying exams, dissertation proposal, and ethics review process. It includes theories and practices of critical pedagogy and praxis, academic and professional publication, and other elements of professional research. Antirequisite: CC9903. 1 Credit.

CC9921 (CMCT 7500 3.0) Technology, Communication and Culture
Employing the insights of the Toronto school and related theories, this course explores culture and technology as productive processes, with emphasis on the historical development of communication technologies and their influence on culture and society. 1 Credit

CC9922 (CMCT 7125 3.0) Cinema and Media: Key Concepts
Explores key concepts, texts and debates in the field of contemporary cinema and media studies. While maintaining a focus on the intellectual and material histories of cinema studies and media studies as disciplines (and their recent convergence), including epistemological and ontological frameworks, methodological approaches, and institutional and technological supports, the course will emphasize recent developments in cinema and media studies. Cinema and cultural theory; national and transnational cinema; cinema and technologies of the image. Antirequisite: GS/FILM 7000 3.00, GS/SPTH 6319 3.00 (York University) 1 Credit

CC9990 (CMCT 7011 3.0) Directed Readings A
A directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's program objectives. Doctoral Course. 1 Credit

CC9991 (CMCT 7012 3.0) Directed Readings B
A directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's program objectives. Doctoral Course. 1 Credit

CC9992 (CMCT 7002 3.0) Directed Research
A directed research course is intended to permit the student to conduct research or develop a theoretical perspective in an area of study related to the student's program objectives. The research may take the form of a pilot study for a thesis or dissertation project. Doctoral Course. 1 Credit

CC9993 (CMCT 7003 3.0) Directed Group Study
Under this heading, a group of students, with the agreement of a faculty member, may organize a seminar in an area not covered in the course offerings. Doctoral Course. 1 Credit

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COMMUNICATION AND DESIGN COURSES

CD8310 Critical Approaches to Cultural Comm.
This course engages critical theories on race, Indigeneity, class, and gender to interrogate notions of cultural competence, cross-cultural and intercultural communication that permeate the study and practice of communication. We ask: who determines culture? What social structures are reinforced in theories and practices of culturally competent communications? We also critically explore how traditional notions of culture are communicated and reinforced across various genres, media, and contexts. 1 Credit

CD8320 Media Lang: Forms, Approaches
This interdisciplinary course will investigate both common elements (visual and auditory narratives, methods of presentation/distribution, cultural roles) and specific attributes (individual characteristics and technologies) of contemporary media forms. Key developments in the evolution of media types and media languages will be explored in the larger context of understanding critical and theoretical issues associated with these forms and languages. 1 Credit

CD8330 Audiences
Attracting and engaging an audience is the key challenge for media professionals and organizations. In our contemporary convergent, networked, media-saturated environment, understanding an active and media literate audience is essential. This seminar examines contemporary audience practices and provides an overview of audience studies and research. Students are given the opportunity to 'get to know' an audience of their own choice. 1 Credit.

CD8340 Media Writing: Critical & Narrative Forms
This course will explore issues of form, expression and viewpoint in writing for contemporary visual arts and media. The emphasis will be on essays and critical studies, but writing of summaries, proposals and analyses will also be covered. Traditions of literary and arts criticism form a basis for study of contemporary writing practices for both print and screen-based media. 1 Credit

CD8350 Socially Engaged Media

Bringing together masters students in Social Work and Documentary Media, this research/creation seminar explores socially engaged practices which privilege collaboration and social interaction in an interdisciplinary dialogue. These practices adopt and borrow from such disciplines as pedagogy, theatre, ethnography, anthropology, art and social work. Through praxis we will explore common methodological problems faced by researchers and practitioners in relation to their subjects and communities. 1 Credit.

CD8351 Documentary as Oppositional Practice
This course will focus on contemporary documentary practices and aesthetic strategies employed by Indigenous, racialized, feminist and LGBT media artists and filmmakers to communicate alternate discourses and diverse perspectives. Drawing upon feminist studies, queer studies, and critical race studies, it will examine the ways in which visual documentary media have been effectively deployed to address issues of identity, power, difference and representation. 1 Credit

CD8360 Research Methods
This course prepares students for the complexity of discipline-specific research and interdisciplinary collaboration. Students will learn both the history of the field of research methods and its embeddedness in canon formation, as well as useful approaches for elucidating research questions and proposal development. 1 Credit

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COMPUTER NETWORKS

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS		Credits
Master's Thesis		(Milestone)
CN8811	Multimedia Proc and Digtl Comm	1
CN8812	LAN and WAN Switching	1
CN8813	IP Protocols	1
CN8814	Network Math and Simulations	1
CN8815	Network Architectures	1
Two Elective credits		2

Master of Engineering

DEGREE REQUIREMENTS		Credits
CN8001	Master's Project/Case Study	2
CN8810	Intro to Computer Networks	1
CN8811	Multimedia Proc and Digital Comm	1
CN8812	LAN and WAN Switching	1
CN8813	IP Protocols	1
CN8814	Network Math & Simulations	1
CN8815	Network Architectures	1
Four Elective credits		4

Electives		Credits
CN8002	Directed Studies	1
CN8003	Selected Topics in Computer Networks	1
CN8816	Network Security	1
CN8817	Wireless Networks	1
CN8819	Multimedia Networks	1
CN8821	Software Engineering	1
CN8822	Network Operating Systems	1
CN8823	Embedded and Real-Time Op Sys	1
CN8824	Server Networks	1
CN8825	Network Design	1
CN8826	Storage Networking	1
CN8827	Data Center Computing	1
CN8828	Cloud Computing	1
CN8831	Adv Topics in Network Security	1
CN8841	Content-Aware Networking	1
CN8861	Network and Service Management	1
CN8871	Wireless Networks II	1

COURSE LISTING

Thesis
The student is required to conduct advanced research on a topic chosen in consultation with the student's thesis supervisor. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the research thesis, and the research results, to this committee. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

CN8001 Project/Case Study
The student will be required to analyze the performance of a network and either design a new network or an upgrade to an existing network. Some approved projects could be undertaken with collaborating external corporation(s) under the supervision of faculty advisor(s). Pass/Fail

CN8002 Directed Studies
A Directed Studies course is an elective in which a student in the Computer Networks MASc program can pursue independent research in a specific area under the guidance of a supervisor. Students are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized publication format. 1 Credit

CN8003 Selected Topics in Computer Networks
This course consists of lectures, seminars, and readings covering the latest advances and research in Computer Networks such as network automation, advanced networking technology, agile network software development, cybersecurity, and networking applications and services. There will be several lab projects to reinforce the topics discussed in the lectures. The course description will be announced prior to scheduling of the course. 1 Credit

CN8810 Introduction to Computer Networks
This course offers a general introduction to computer networks. It explores goals, services and problems with computer networks. Computer communication is examined using the seven-layer OSI model. The purpose of each layer is discussed both from conceptual and practical aspects. Topics include: OSI model, layered architecture, data link protocols, LAN protocols, WAN protocols and details of Internet protocol. There will be several lab projects to reinforce the topics discussed in the lectures. 1 Credit

CN8811 Multimedia Processing and Digital Communication
The course first covers the basic concepts in source and channel coding techniques. It subsequently introduces various aspects of multimedia processing. Topics include: sampling, quantization, PCM, DPCM, delta modulation, line coding, digital modulation, information theory on entropy, Huffman coding, Lempel Ziv coding, model-based coding, information theory on channel capacity, linear block codes, cyclic codes, convolutional codes, trellis code modulation, multimedia data compression standards, and multimedia information retrieval. Theoretical concepts will be re-enforced through some real-time experiments in the laboratory using Matlab and C. 1 Credit

CN8812 LAN and WAN switching
This course covers both LAN and WAN switching. In addition, it discusses various WAN technologies. It first covers Ethernet switching and related topics such as spanning tree, VLAN, and trunking. Next, it examines switch architectures and performances. The protocols in X25 and Frame-Relay networks are then studied. ATM technology and protocols are discussed with the emphasis on Quality–of-Services (QoS), traffic shaping, and traffic policing. Finally, various wide-area access technologies are introduced and studied. Prerequisite CN8810. 1 Credit

CN8813 IP Protocols
The course provides an in-depth coverage of the Internet protocols. It has two main focuses. First, it studies various interior gateway protocols: RIP, IGRP, Enhanced IGRP, and OSPF. It then concentrates on the protocols related to the Internet operations and management, such as ICMP, DHCP, DNS, and SNMP. Other topics include multicasting and IPv6. Prerequisite: CN 8810.
1 Credit

CN8814 Network Mathematics and Simulations
This course provides foundations in probability and random processes, and develops the understanding of Markov processes and the simulation of Markov Chains. The course also covers queuing systems and Monte Carlo simulation. Basic simulation and modeling techniques are then discussed, followed by output data analysis. The course concludes with various Computer Networks Simulation projects using OPNET. Prerequisite: CN8810. 1 Credit

CN8815 Network Architectures
This course covers the design aspects of large scale internets. It introduces the concept of route distribution and examines the use of Border Gateway Protocol (BGP) for interdomain routing. Multi-Protocol Label Switching (MPLS), an advanced datagram forwarding architecture, is also introduced, and its applications in Virtual Private Networks (VPNs) and traffic engineering are studied. Prerequisite: CN8813. 1 Credit

CN8816 Network Security
This course covers the cryptographic algorithms and secure protocols, and their applications in security mechanisms for computer networks. The course introduces conventional encryption algorithms and Public Key Algorithm with integrity mechanism. Authentication mechanisms for OSI protocols and TCP/IP are also discussed, and their applications in Firewall and IDS (Intrusion Detection System) are studied using actual industrial (for example CISCO's) products. Prerequisite: CN8813. 1 Credit

CN8817 Wireless Networks
This course provides an overview of wireless networking, including wireless physical characteristics and mobility, wireless channel characteristics, signal propagation and multiplexing techniques. Specialized medium access protocols for TDMA and CDMA are then discussed, followed by an overview of the architecture of 3G systems (UMTS and CDMA2000). The course also discusses the IEEE 802.11 standard for wireless LAN, mobile routing techniques including Ad Hoc networking, mobile IP and roaming protocols, and wireless transport/TCP enhancements. The course also includes a design project of a small scale wireless network. Prerequisite: CN8813. 1 Credit

CN8819 Multimedia Networks
This course covers the concepts and design of multimedia networks. It first introduces the real-time transport protocols and various signaling protocols in multimedia-over-IP environments. A significant part of the course discusses the design and implementation of integrated voice/data networks. Different methods will be investigated to maintain the desirable voice quality performance. The course includes the following topics: Signaling system #7 (SS7), RTP and RTCP, multimedia signaling protocols such as H323, SIP, and MGCP, congestion control methods, and RSVP. Prerequisite: CN8813. 1 Credit

CN8821 Software Engineering
This course includes the study of the software development process, software requirements and specifications, and software design techniques. The material is presented in the context of distributed networked systems design and implementation. 1 Credit

CN8822 Network Operating Systems
This course focuses on the issues surrounding network design using Unix and Microsoft Windows Operating Systems (OS). It explores the structure and networking capabilities of the OS's, introduces students to OS interprocess communication and client-server application design. The lab component focuses on network design, providing essential network services, and monitoring performance using Unix and Microsoft Windows servers. Prerequisite: CN8810. 1 Credit

CN8823 Embedded & Real-time Operating Systems
This course covers the basics of real-time operating systems and embedded system organization. It introduces the background knowledge required for understanding real-time and embedded systems, architecture of embedded networking devices and system on chip technologies. The students will be able to grasp the internals of an operating system including processes/tasks threads and scheduling techniques. The course will emphasize real-time task scheduling and provide hands on experience to develop applications using the industry standard real-time operating system, VxWorks. Tornado integrated development environment from Wind River Systems will be employed for developing VxWorks applications. Fault-tolerance concepts required for safety critical and high availability real-time systems will also be presented in the course. Case studies of various networking devices utilizing the real-time system concepts will also be conducted. 1 Credit

CN8824 Server Networks
This course explores the technology required for a modern data center design. Three main areas of the design are examined: server-to-server/server-to-storage communication infrastructure, distributed computing environments including middleware, and distributed storage. Topics include: Fibre Channel, Infiniband, FICON, iSCSI communication protocols; high-performance computing, computer clusters and grid computing; storage area network (SAN) and storage virtualization techniques. The topics discussed in the lecture will be reinforced with the laboratory assignments requiring setting up and examining performance of various data center components. Prerequisite: CN8810. 1 Credit

CN8825 Network Design
This course presents the methods used for the design of various types of communication networks. The topics include: management and business perspectives on network design, estimation of traffic demand, network cost analysis, topological design, capacity assignment, routing, virtual network design, wireless network design, availability analysis and survivable network design. Prerequisite: CN8810. 1 Credit

CN8826 Storage Networking
The course objective is to explore the design and implementation of intelligent storage systems interconnected in Storage Area Network (SAN) infrastructure. The prevailing SAN technology with the focus on advanced SAN traffic engineering and management will be studied. The course also investigates the new SAN development trends driven by the data center virtualization and cloud computing, explores the storage and data networks relationship, and looks into the storage virtualization techniques and performance objectives. 1 Credit

CN8827 Date Center Computing
The objective of the course is to enable students design scalable, reliable and intelligent data center computing and virtualization solutions based on the latest technologies, including a comprehensive set of techniques for distributing computing resources and virtualization. It describes the data center unified computing and virtualization tools, explores the techniques for designing scalable data center architecture and explains how to evaluate existing data center solutions. Prerequisite: CN8824 and CN8826. 1 Credit

CN8828 Cloud Computing
The objective of the course is to introduce the purposes and architectures of different cloud types, and compare the advantages of cloud services to classical data center. The course would encompass virtualization technologies at compute, storage, network, desktop, and application levels as well as cloud building blocks. Prerequisite: CN8824 and CN8826. 1 Credit

CN8831 Advanced Topics in Network Security
Students of this course will obtain a firm understanding of the theory and applications of network security. Topics include: AAA mechanisms, secure policy manager, network secure management, Internet security and privacy, and web security. In addition, it covers wireless security fundamentals and addresses common risks and threats on wireless environment.
Prerequisite: CN8816. 1 Credit

CN8841 Content-Aware Networking

This course provides a focused perspective on the core technologies of the World Wide Web, and also state-of-the-art technologies of how to improve the web performance and how to build a content-aware and intelligent network. We focus on architectures, protocols, standards and devices (such as client, proxies, servers and load balancers) that constitute the web and deliver the content across the Internet. The course also covers web caching, content delivery networking, peer-to-peer networking, and multimedia streaming. Prerequisite: CN8810. 1 Credit

CN8861 Network and Service Management
The subject is introduced with an overview of Network Management frameworks such as the OSI, TMN, and the IEFT models. The course then focuses on the IETF framework, Internet Management that includes SNMP protocol, Management Information Base (MIB), and Agent Architectures. Part 2 of this course focuses on Network Services and Service Management. The course introduces VPN Services Architecture and walks through the steps for deploying and managing VPN services in a Service Provider network. Prerequisite: CN8810. 1 Credit

CN8871 Wireless Networks II
This course provides in-depth studies in areas of wireless LAN, Cellular, and Mobile networks such as Wireless Mesh, Ad-hoc, WiMAX, and Sensor networks. Advanced topics in 3G and 4G are covered in Physical, MAC and Network layers, including Mobility and Resource management, QoS, Security, all-IP and Technology Integration. Wireless contemporary and future applications like VoIP and IPTV over wireless are also investigated. The course provides a major laboratory component on various topics. 1 Credit

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COMPUTER SCIENCE

CURRICULUM
Fall 2025

Master of Science

DEGREE REQUIREMENTS		Credits
Thesis Option		
Master's Thesis*		(Milestone)
Master's Seminar*		(Milestone)
CP8101	Research Methods#	Pass/Fail
OR		
CP8337	Directed Studies: Research Methodologies#	Pass/Fail
3 Electives *		3

#If a student has already taken a graduate-level Research Methods course as part of a previous degree, an additional elective may be substituted with the approval of the supervisor and GPD.

Major Research Paper (MRP) Option		
Major Research Paper (MRP)**		(Milestone)
Master's Seminar**		(Milestone)
6 Electives **		6
Course Only Option		
8 Electives ***		8

AI SPECIALIZATION OPTION
AI specialization Electives
CP8206, CP8210, CP8305, CP8307, CP8314, CP8318,
CP8319, CP8321, CP8322, CP8323, CP8325, CP8326, CP8339.
* For the AI option a minimum of 2 of the 3 electives must be from the AI electives and the thesis and seminar presentation must be on an AI topic.
** For the AI option a minimum of 4 of the 6 electives must be from the AI electives and the MRP and seminar presentation must be on an AI topic.
*** For the AI option a minimum of 6 of the 8 electives must be from the AI electives.

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Doctoral Candidacy Examination		(Milestone)
Doctoral Dissertation		(Milestone)
Doctoral Seminar		(Milestone)
CP8101	Research Methods#	Pass/Fail
OR		
CP8337	Directed Studies: Research Methodologies#	Pass/Fail
3 electives (minimum)		3

#If a student has already taken a graduate-level Research Methods course as part of a previous degree, an additional elective may be substituted with the approval of the supervisor and GPD.

Electives		
CP8201	Advanced Algorithms	1
CP8202	Advanced Software Engineering	1
CP8203	Advanced Database Systems	1
CP8204	Advanced Programming Languages	1
CP8205	Adv Human-Computer Interaction	1
CP8206	Soft Computing and Machine Intel	1
CP8210	Topics in Data Science	1
CP8301	Secure Computing	1
CP8302	Software Metrics	1
CP8305	Knowledge Discovery	1
CP8307	Introduction to Computer Vision	1
CP8308	Visualization	1
CP8310	Directed Studies: Master's	1

CP8312	Directed Studies: Doctoral	1
CP8314	Advanced Artificial Intelligence	1
CP8317	Performance Evaluation	1
CP8318	Machine Learning	1
CP8319	Reinforcement Learning	1
CP8320	Program Analysis for Cyber Security	1
CP8321	Introduction to Deep Learning	1
CP8322	Deep Learning in Computer Vision	1
CP8323	Advanced Natural Language Processing	1
CP8324	Computational Geometry	1
CP8325	Digital Image Processing	1
CP8326	Heuristic Search	1
CP8327	Model-Driven Engineering	1
CP8328	Theory of Computation	1
CP8335	Special Topics: Master's	1
CP8336	Special Topics: Doctoral	1
CP8338	Quantum Computing and Soft Eng	1
CP8339	Recommender Systems	1
CP9101	Method of Instruction	1

COURSE LISTING

Doctoral Candidacy Examination
Each student is required to complete a Candidacy Examination. The examination is normally conducted during a candidate's fourth term of residence, and must be held no later than 20 months from the date of initial registration. The examination consists of two parts: a written examination, the questions to be set by the student's Supervisory Committee; and an oral defense of the written examination and of the dissertation proposal. This is a "Milestone".

Doctoral Dissertation
The culmination of each student's work within the Doctoral program is the Doctoral Dissertation or Thesis. The dissertation is the written record of the student's original and significant research. The PhD student is required to conduct advanced research related to one (or more) of the following fields: Intelligence and Robotics, or Computer Communication Networks. Other areas may be considered if appropriate expertise exists among the faculty members associated with this program. The research topic is selected in consultation with the student's supervisor(s). The approval process for proposed work on a dissertation involves two steps: the student must present a written research proposal to a Dissertation Supervisory Committee to ensure that the proposal has merit and can be achieved and the student must pass a candidacy exam. The research itself is carried out under the direction of the student's supervisor(s) and monitored by the Supervisory Committee. When the research is complete, the results are submitted in written format in the form of a Thesis as specified by program guidelines. The thesis must receive the approval of the student's supervisor(s) and the members of the Dissertation Supervisory Committee as described by the appropriate policies of the Yeates School of Graduate Studies before the work can undergo examination. When the thesis is approved, the student's supervisor will convene a public oral examination conducted according to the policies of the Yeates School of Graduate Studies. Through the thesis, and their Oral Defence of it, the student is expected to provide evidence of competence in carrying out original and independent research, a sound understanding of the material associated with it and a broad grasp of the discipline of Computer Science. Each student is required to pass the final Defence Examination of their dissertation. This is a "Milestone".

Doctoral Seminar
Doctoral students are required to participate in departmental seminars designed to engage with current research in specialized fields and emerging areas within computer science. These seminars will feature presentations by graduate students, faculty members, visiting scholars, and guest speakers. Each student must attend a minimum of 15 publicly-announced seminars and actively engage in discussions. Additionally, students are required to deliver 2 oral presentations that showcase their research progress and findings, demonstrating advanced scholarly contribution. This is a "Milestone".

Master's Seminar
Master's students are required to participate in departmental seminars designed to engage with current research in specialized fields and emerging areas within computer science. These seminars will feature presentations by graduate students, faculty members, visiting scholars, and guest speakers. Each student must attend a minimum of 10 publicly-announced seminars and actively engage in discussions. Additionally, students are required to deliver 1 oral presentation that showcases their research progress and findings, demonstrating advanced scholarly contribution. This is a "Milestone."

Major Research Project (MRP)
The student is required to complete a research paper on a topic related to computer science. The research topic is selected in consultation with the student's supervisor, after which the student must submit a written proposal of the research to be conducted. The research paper will be evaluated by the supervisor and a second reader -- normally also from the same program or a related graduate program. This is a "Milestone".

Master's Thesis
The thesis embodies the results of the student's research program and exposes the work to scholarly criticism. It must represent a single body of work, with integrated material, and should not be solely a collection of published articles. This is a "Milestone."

CP8101 Research Methods
This course is designed to assist graduate students in developing the skills necessary to design and execute a research protocol aligned with their degree requirements. It complements the specific research programs devised by the student in collaboration with

their supervisors. The course covers several topics, such as: the nature of scientific inquiry, library research skills, formulation and testing of hypotheses, experimental design, literature reviews, publishing in peer-reviewed venues, and professional responsibilities in research. Pass/Fail

CP8201 Advanced Algorithms
This course covers advanced methods of algorithmic design and analysis with focus on efficiency and correctness of algorithms. The course reviews several popular algorithm design techniques and selected well-known algorithms. The final parts of the course include introduction to practical algorithms for computationally challenging problems, using heuristics, approximation algorithms and introduction to randomization algorithms. 1 Credit

CP8202 Advanced Software Engineering
Modern approaches to software development are studied including requirements analysis, system design techniques, formal description techniques, implementation, testing, debugging, metrics, human factors, quality assurance, cost estimation, maintenance, and tools. 1 Credit

CP8203 Advanced Database Systems
Object-Oriented and Object-Relational Database Systems; Distributed and Multi-database Systems; Advanced Database Applications: Web-Based Database Access, Data Warehouses. 1 Credit

CP8204 Advanced Programming Languages
A study of the principles, concepts, and mechanisms of computer programming languages - their syntax, semantics, and pragmatics; the processing and interpretation of computer programs; programming paradigms; and language design. Additional topics will include language design principles and models of language implementation. 1 Credit

CP8205 Advanced Human-Computer Interaction
Current trends in user interface technology; topics include alternative interaction devices, user interface tools, and interface modeling techniques. Usability testing and human factors. 1 Credit

CP8206 Soft Computing and Machine Intelligence
Introduction to basic concepts and techniques of soft computing including: neural, fuzzy, evolutionary computation and their applications. 1 Credit

CP8210 Topics in Data Science
This course presents concepts related to data science research activities including data management and analytics, data modeling, structured and unstructured data, regression models, social data analysis, web and data mining, information retrieval, text analysis and natural language processing. 1 Credit

CP8301 Secure Computing
The importance of security for computer systems: protection, access control, distributed access control, Unix security, applied cryptography, network security, firewalls, secure coding practices, safe languages, mobile code. Computer and network forensics techniques. Computer security techniques. Legal and Ethical issues. Topics may include cryptographic protocols, privacy, anonymity, and/or other topics as time permits. 1 Credit

CP8302 Software Metrics
The theory of measurement, experimental design, software metrics collection, statistics for analyzing measurement data, software size and software structure, resource measurement, prediction of software characteristics, planning software measurement, software quality and reliability. 1 Credit

CP8305 Knowledge Discovery
Steps in the process of knowledge discovery: data preprocessing, data mining, post-processing and knowledge utilization. Preprocessing: data cleaning, integration, transformation and reduction. Data mining methods: association rules, classification and clustering. Post-processing: knowledge evaluation, interpretation, presentation and visualization. Knowledge discovery and data management. Possibly other selected topics in knowledge discovery. 1 Credit

CP8307 Introduction to Computer Vision
This course describes foundational concepts of computer vision. In particular, the course covers the image formation process, image representation, feature extraction, model fitting, motion analysis, 3D parameter estimation and applications. 1 Credit

CP8308 Visualization
Use of computer graphics to understand patterns, relationships and trends in scientific and information systems data. Topics include: historical overview, fundamental concepts, scientific visualization techniques for scalar and vector data, visualization systems, interaction with 2D/3D graphical interfaces, web-based visualization and collaborative visualization over the internet, software visualization, information visualization. 1 Credit

CP8310 Directed Studies: Master's
This course is for Master's students who wish to gain knowledge in a specific area for which no graduate level classes are offered. Students are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized format. Not available to Course option students. 1 Credit

CP8312 Directed Studies: Doctoral
This course explores theoretical, practical and experimental (if applicable) problems in great depth in the areas of intelligence and robotics with emphasis on the aspects of Intelligence and Robotics and their application related to the discipline of Computer Science. Doctoral students must present their findings in a formal report. 1 Credit

CP8314 Advanced Artificial Intelligence
The course will focus on the theory and implementation of dynamical systems from the perspective of artificial intelligence. The emphasis will be on the compromises involved in providing useful logical representations that allow reasoning about actions to remain tractable. The course will show how these research issues are relevant for many applications beyond the traditional area of artificial intelligence. 1 Credit

CP8317 Performance Evaluation
Probability Theory; Transforms of probability distributions; Branching processes; Discrete time Markov Chains; Continuous time Markov Chains; Birth-Death processes ; Intermediate queuing theory, M/G/1 queues ; Renewal theory; Gated and limited systems; Hidden Markov model. 1 Credit.

CP8318 Machine Learning
Machine learning is the study of algorithms that learn to perform a task from prior experience. Machine learning has a broad range of applicability, including computer vision, robotics, medical diagnosis, bioinformatics and natural language processing. This course will cover the underlying theory and practical applications of machine learning. 1 Credit.

CP8319 Reinforcement Learning
This course focuses on topics related to reinforcement learning. The course will cover making multiple-stage decisions under uncertainty, heuristic search in planning, Markov decision processes, dynamic programming, temporal-difference learning including Q-learning, Monte Carlo reinforcement learning methods, function approximation methods, and the integration of learning and planning. 1 Credit.

CP8320 Program Analysis for Cyber Security
This course will focus on Language-Based Security, an area of research that studies how to enforce application-level security using program analysis techniques. This includes techniques used to automate the detection\prevention of security vulnerabilities caused by coding malpractice or security-policy misconfigurations; the study of the design and implementation of secure programming languages; and techniques used to enforce correct usage of security Application Programming Interfaces. 1 Credit

CP8321 Introduction to Deep Learning
This course is an introduction to deep learning and its applications. The main topics discussed in the course include feedforward/recurrent neural networks, backpropagation learning algorithm, Convolutional Neural Networks (CNN), Long Short Term Memory (LSTM), and Autoencoders. 1 Credit

CP8322 Deep Learning in Computer Vision
Computer vision is broadly defined as the study of recovering useful properties of the world from one or more images. In recent years, deep learning, an expansive term covering trainable, hierarchical network architectures, has emerged as a central tool for addressing computer vision tasks. This course will cover a range of topics at the intersection of deep learning and computer vision, including object recognition, object detection, and video understanding. 1 Credit

CP8323 Advanced Natural Language Processing
This course introduces students to the topics of Advanced Natural Language Processing. Topics include: introduction to NLP, statistics review, information extraction, annotating data, lexical semantics, text clustering, text classification, sentiment analysis, question answering, deep learning models and model interpretability. 1 Credit

CP8324 Computational Geometry
Computational Geometry studies problems which can be described geometrically. Such problems arise from our environment as we deal with geometric objects and their interactions, such as in computer graphics, robotics, and manufacturing. In this course, students learn to design algorithms and data structures for geometric problems. These problems include but are not limited to the following topics: convex hull, Voronoi diagram, triangulation, visibility, and geometric data structures. 1 Credit

CP8325 Digital Image Processing
Digital image processing has been widely used in our daily lives, from entertainment, multimedia, to medicine. This course introduces the fundamentals and principles of digital image processing and its applications. Students will gain hands-on experience in using image processing techniques to solve practical problems. Topics include image acquisition, transformation, filtering, enhancement, and compression, as well as state-of-the-art developments in image processing. 1 Credit

CP8326 Heuristic Search
Heuristic search is a popular Artificial Intelligence method used in a variety of applications including robotics, combinatorial optimization, route pathfinding, and automated planning. In this course, we will investigate algorithms for solving search problems, and consider methods for automatically generating heuristic functions. Topics will include optimal and suboptimal search algorithms, abstraction and graph embedding-based heuristic generation methods, and Monte Carlo Tree Search. 1 Credit

CP8327 Model-Driven Engineering
This course is designed to introduce students to the field of model-driven engineering (MDE). MDE is a software and systems development methodology in which software models are treated as first-class citizens in the engineering process. Topics to be discussed include modelling languages, domain-specific modelling, model transformation, model management, modelling and simulation, and model analysis. Required background: Basic software engineering knowledge is expected. 1 Credit

CP8328 Theory of Computation
This course introduces students to the theory of computation. Topics include: regular expressions and languages, finite state automata, context-free languages, pushdown automata, Turing machines, computability, and NP-completeness. 1 Credit

CP8335 Special Topics: Master's
This special topics course examines selected, advanced topics in areas related to the core and emerging areas of computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor. 1 Credit.

CP8336 Special Topics: Doctoral
This special topics course will present material that is not currently part of the regular Computer Science doctoral program but are of interest to faculty and students. 1 Credit

CP8337 Directed Studies: Research Methodologies
This course offers students the opportunity to engage in individualized, in-depth study of research methodologies in computer science under the supervision of a faculty member. The course is designed to develop advanced skills in designing, conducting, and evaluating research, emphasizing the critical analysis of existing work, research design principles, and the ethical dimensions of conducting research. Students will work closely with their supervisor to tailor the course content to their research interests and academic goals. Pass/Fail

CP8338 Quantum Computing and Soft Eng
This course introduces students to the rapidly evolving quantum computing and quantum software engineering fields. Students will gain an understanding of quantum computing fundamentals, algorithms, post-quantum cryptography, and quantum software development practices. 1 Credit

CP8339 Recommender Systems
Recommender systems are software systems that help users in the decision-making process. They serve as filtering tools to alleviate the information overload problem. In this course, students will learn the basic concepts of recommender systems, three types of recommender systems (content-based, collaborative filtering and hybrid), popular models (machine learning based, matrix factorization, deep learning based) and evaluation measurements. Special recommendation applications and advanced topics may be discussed, such as session-based recommender systems, fairness and bias. 1 Credit

CP9101 Method of Instruction
Students will learn to select appropriate teaching methods; establish goals and performance objectives and construct lesson plans. Students will be shown classroom management and presentation techniques. In addition, students will be introduced to the principles of learning and instruction. Student will learn to formulate questions and employ good questioning technique. Each student will be given opportunities to prepare and present short lessons. Each student will be required to prepare and present at least two five-minutes lessons based on computer science related topics. Student lessons will be evaluated by the student, class members and the instructor. 1 Credit

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CRIMINOLOGY AND SOCIAL JUSTICE

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
Major Research Paper (MRP) Option		
Major Research Paper (MRP)		(Milestone)
CR8001	Criminology and Social Justice Seminar	1
CR8002	Critical Engagement and Criminological Theories	1
CR8003	Quantitative Research Methods	1
	OR	
CR8004	Qualitative Research Methods	1
	AND	
3 Electives		3
Coursework and Field Placement Option		
CR8001	Criminology and Social Justice Seminar	1
CR8002	Critical Engagement and Criminological Theories	1
CR8003	Quantitative Research Methods	1
	OR	
CR8004	Qualitative Research Methods	1
	AND	
CR8100	Field Placement	1
4 Electives		4
Coursework Only Option		
CR8001	Criminology and Social Justice Seminar	1
CR8002	Critical Engagement and Criminological Theories	1
CR8003	Quantitative Research Methods	1
	OR	
CR8004	Qualitative Research Methods	1
	AND	
5 Electives		5
Electives		
CR8101	Justice Policy	1
CR8102	Inequality, Social Justice, and Criminal Justice	1
CR8103	Graduate Special Topics Seminar	1
CR8104	Practitioners Seminar	1
CR8105	Directed Studies	1
CR8201	Historical Criminology	1
CR8202	Crime and Technology	1
CR8203	Immigration and Crime	1
CR8204	Security Threats	1
CR8205	Colonial Abolition	1
CR8206	Criminalization of Black Women's Dissent	1

COURSE LISTING

Major Research Paper
This is a "Milestone"

CR8001 Criminology and Social Justice Seminar
This seminar will cover a wide variety of topics related to crime, law, and social justice. An examination of the social, political, historical, and legal construction will be analyzed through a series of topics with specific consideration given to the governance of crime and law in local, national, and international settings. 1 Credit

CR8002 Critical Engagement
In addition to broadening students' understandings of criminological theories generally, this course will take an explicitly social justice approach to criminological theory development and application. Students will be expected to expand their critical thinking skills in relation to the theoretical foundations of the field of Criminology. They will draw on competing theories to analyze historical and contemporary issues with a special focus on social justice, critically evaluating how they shape both individual and institutional responses to the criminal justice system and understandings of crime and criminality. 1 Credit

CR8003 Quantitative Research Methods
This course will prepare students to understand, design, and carry out quantitative research that has direct implications for work in criminological and social justice fields. Students will learn quantitative research skills through hands-on experience designing a survey and/or utilizing an existing dataset, analyzing the data with quantitative software, and applying critical, social justice perspectives to the results. 1 Credit

CR8004 Qualitative Research Methods
This course will focus on developing qualitative methodological skills in order to prepare students to collect ethical and social justice data related to criminology and the criminal justice system. Students will gain an understanding of some of ways in which research questions are answered in qualitative studies, as well as the possibilities and limitations of any one approach. Over the duration of the course, students will engage with central debates about criminalization, ethics, and power in research settings and processes. 1 Credit

CR8100 Field Placement
This community- and experiential-oriented placement will provide students with the option of a placement with an organization, for instance, a non-governmental organization (NGO), an international intergovernmental organization, or government agency, and so on, that works directly or indirectly in the field relevant to their research interests. Field placement will enable students to discover how research operates in practice. Minimum of 120 hours of field work. Pass/Fail 1 Credit

CR8101 Justice Policy
Criminal justice policy changes constantly, from laws and state responses to crime as set out in the Criminal Code to the daily practicalities associated with judicial decision-making, policing, and prison administration. This course will provide students with an understanding of several major issues relating to criminal justice policy in Canada. It will consider the social and economic issues associated with individual or group involvement in the criminal justice system and the process by which criminal justice policies are established, revised, and administered. 1 Credit

CR8102 Social and Criminal Justice
This course will examine various forms of social inequality as they intersect with the criminal justice system in Canada and internationally. It will adopt a social, criminal, and community-based focus to critically analyze the operational and policy decisions on race, class, gender, legal status and other forms of social inequality, as well as their impact on criminal and social justice. 1 Credit

CR8103 Graduate Special Topics Seminar
An in-depth examination of a specific area of Criminology and social justice, as determined by the instructor on an annual basis. The special topics discussed will vary from year to year and will be based on the instructor's area of expertise. Potential special topics seminars include: International Law and Policy; Terrorism/Violent Extremism; Urban Violence; Crime Policy; Indigenous Rights; Human Rights; Youth Justice; Gender and the Criminal Justice System; and more. 1 Credit

CR8104 Practitioners Seminar
This course will feature practitioners from a variety of criminology and social justice oriented fields to discuss working in their field, and the application of substantive knowledge in the field to the actual work experience. This seminar will also be available to students who opt for a field placement. 1 Credit

CR8105 Directed Studies
This course is designed for individual students who may need a course related to their area of concentration that is not satisfied through course offerings. It will normally be a reading course under the direct supervision of an assigned faculty member with expertise in the chosen subject field. The course requirements will be negotiated on an individual basis with the supervising faculty member, in consultation with the Graduate Program Director. 1 Credit

CR8201 - Historical Criminology
This course will examine the development of modern criminal justice institutions and the logic that underpins them. It reflects on historical processes of criminalization and their social impact in producing and perpetuating inequalities. It will also provide an introduction to the methodological approaches that historians employ to learn about the past, with the aim to deepen student's understanding of crime, the criminal justice system, and the campaigns for social justice they inspire. 1 Credit

CR8202 – Crime and Technology
This course builds on criminological studies of crime in the "cyber society" where daily life cannot be understood independent of technologies like the internet and the smartphone. This course asks how the development of technologies like social media and the surveillance camera have affected crime and crime control. Each week, students will discuss a specific technology's role in crime and crime control. 1 Credit

CR8203 – Immigration and Crime
This course will explore whether the public perception, that increasing immigration and higher levels of crime are inextricably linked, is supported by evidence. After providing an introduction to the various theories examining the relationship between immigration and crime, this course will survey the empirical research both at the individual-level and at the aggregate-level on the relationship between immigration and crime. There will be an ongoing focus on debates about key issues. 1 Credit

CR8204 – Security Threats
This graduate seminar examines the ways radicalization to violence/violent extremism (RTV/VE) is constituted and managed in Canada. Drawing on critical and interdisciplinary research and theory, we examine the etiology, manifestations and consequences of this violence, and conclude with an examination of tactics used to respond to RTV/VE, with an emphasis on the disconnect between heavy reliance on 'hard security strategies' and what the evidence base has to say about their efficacy. 1 Credit

CR8205 – Colonial Abolition
This course will examine theoretical frames and political approaches to justice that build upon Indigenous legal orders and political movements. It will draw on the Black Radical and abolitionist traditions, examining intersections – both convergent and divergent – between Black and Indigenous refusals of state solutions to state-induced violence, while analyzing respective histories and impacts of racial, gender, class and colonial oppression and containment. 1 Credit

CR8206 – Criminalization of Black Women's Dissent
In this seminar, we focus on the historical and present day perspectives of Black women who have experienced processes of criminalization for their acts of civil disobedience, activism and defiance to violent systems in their life, by a close read of three autobiographical and biographical texts and one podcast. In-depth topics include: processes of criminalization, perceptions of crime, respectability politics, violence, acts of resistance, and interactions with the criminal justice system. 1 Credit

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MASTER OF CYBERSECURITY (MC)

CURRICULUM

[First offered Fall 2025]

Master of Cybersecurity

DEGREE REQUIREMENTS		**Credits**
CB8101	Fund. of Info Assurance	1
CB8102	Cybersecurity Risk Management	1
CB8103	Cyber FWs, Gov., and Compliance	1
CB8104	Security Architecture	1
CB8105	Fundamentals of Security Tech.	1
Three credits from the Electives List		3

ELECTIVES		
CB8201	Privacy, Law and Ethics	1
CB8202	Sec. Ops. Bus. Cont. Dis. Rec.	1
CB8203	Simulations in the Cyber Range	1
CB8204	Software Development Security	1
CB8205	Network Security	1
CB8206	Applied Cryptography	1

COURSE LISTING

CB8101 Fundamentals of Information Assurance

This course provides an overview of the managerial processes of cybersecurity that are fundamental to an enterprise cybersecurity program and discusses how they can best be implemented and maintained with best practices. It focuses on the principles of security management, security policy, human resources security, information management, physical and infrastructure security, supply chain management as well as security audit. The course will also discuss securing the past, present and future of an enterprise by means of appropriate security controls, 1 Credit

CB8102 Cybersecurity Risk Management

This course gives an overview of internal and external cybersecurity risks to organizations and how they can be managed. It outlines the tactics, techniques, and procedures of threat actors, as well as their motivations and intent. It covers risk assessment, analysis, management, and treatment—as well as the frameworks, international standards, and guidelines that regulate these practices. It explains methods of equipping organizations to make informed business risk decisions, depending on their industries and the maturity level of their security programs. 1 Credit

CB8103 Cyber FWs, Gov., and Compliance

This course gives an overview of the regulatory and industry-driven frameworks that govern an organization's cybersecurity program. Topics covered include the governance, risk, and compliance (GRC) concepts that apply to cybersecurity; the role of a Chief Information Security Officer (CISO), including its historical evolution; the implementation of cybersecurity governance within a business risk program; and methods of achieving cybersecurity compliance within an IT risk management program. 1 Credit

CB8104 Security Architecture

This course will explore the concept of security architecture in a time of change. Where traditional security architectures involved protecting the "perimeter" of the organization's network, many organizations are moving to cloud-hosted services. The course will cover the security architect's role in assessing what information can and should be stored in the cloud, and in setting up security infrastructure—as it applies to IT networks, data protection, security monitoring, and auditing. 1 Credit

CB8105 Fundamentals of Security Technologies

This course provides an overview of the technology that is fundamental to an organization's cybersecurity program and considers how it can best be deployed. It focuses on the principles of identity security and access management (IAM) as well as the protection of data, the world's modern currency. Concepts covered include role-based access, access modeling, trust models for access control, privileged account management, credential management, and authentication. The course will also discuss the way innovation works in cybersecurity. 1 Credit

CB8201 Privacy, Law and Ethics

This course examines the legal and ethical aspects of the relationship between privacy and cybersecurity. The legal and ethical obligations of cybersecurity professionals, and of organizations, with respect to privacy and personal information protection are explored. Key conceptual ideas, such as treating privacy and security as a “zero-sum” game, privacy by design and by default, and ethical programming are reviewed and discussed. No prior knowledge of law or ethics is required. 1 Credit

CB8202 Sec. Ops Business Cont. Disaster Recovery

Principles and practices of enterprise continuity and disaster recovery are presented with respect to cybersecurity operations within an enterprise framework, using the elements of cyber resilience: prepare/identify, protect, detect, respond, and recover as teaching principles. 1 Credit

CB8203 Cyber Simulations in the Cyber Range

This course provides an overview and survey of multiple cyber security frameworks and implements these frameworks practically in the Catalyst Cyber Range: a unique cybersecurity training and testing platform that provides immersive and ultra-realistic experiential learning opportunities. The Catalyst Cyber Range features a customizable technology platform and an array of real-world cybersecurity scenarios. This course focuses on the technical areas of the enterprise, incident response, penetration testing, cybersecurity operations, digital forensics and network security. The NIST Cybersecurity, Mitre ATT&CK and Cyber Kill Chain frameworks are applied in multiple cyber scenarios. 1 Credit

CB8204 Software Development Security

This course provides an overview of Software security that along with cryptography, access control and security protocols is fundamental to an organization’s cybersecurity program. The course focuses on the main sources of insecurity in software including software flaws as unintentional source of insecurity and malware as the intentional source, and discusses how the flaws and malware can be exploited through software reverse engineering (SRE). The course also covers main concepts of security in operating systems (OS) including security. 1 Credit

CB8205 Network Security

With the growing use of online distributed processing, secure access to computing infrastructure is of paramount importance that can be ensured by the network security. This course explores concepts, tools and services necessary to achieve network security design. It discusses authentication and IPSec VPN including site-site VPN. It explains protection of the network through access control and firewall. The modern networks face enormous attacks by intruders... The course assumes a working knowledge of cryptography. 1 Credit

CB8206 Applied Cryptography

This course provides a rigorous treatment of modern applied cryptography, emphasizing both theoretical foundations and practical applications. Topics include advanced symmetric and asymmetric cryptosystems, cryptographic hash functions, message authentication codes, digital signatures, key management protocols, and advanced cryptographic protocols such as zero-knowledge proofs and secure multi-party computation. The course also explores real-world applications and current research trends in areas such as blockchain technologies, privacy-preserving computation, and post-quantum cryptography. 1 Credit

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MASTER OF CYBERSECURITY (MC)

CURRICULUM

[First offered Fall 2025]

Master of Cybersecurity

DEGREE REQUIREMENTS		**Credits**
CB8101	Fund. of Info Assurance	1
CB8102	Cybersecurity Risk Management	1
CB8103	Cyber FWs, Gov., and Compliance	1
CB8104	Security Architecture	1
CB8105	Fundamentals of Security Tech.	1
Three credits from the Electives List		3

ELECTIVES		
CB8201	Privacy, Law and Ethics	1
CB8202	Sec. Ops. Bus. Cont. Dis. Rec.	1
CB8203	Simulations in the Cyber Range	1
CB8204	Software Development Security	1
CB8205	Network Security	1
CB8206	Applied Cryptography	1

COURSE LISTING

CB8101 Fundamentals of Information Assurance

This course provides an overview of the managerial processes of cybersecurity that are fundamental to an enterprise cybersecurity program and discusses how they can best be implemented and maintained with best practices. It focuses on the principles of security management, security policy, human resources security, information management, physical and infrastructure security, supply chain management as well as security audit. The course will also discuss securing the past, present and future of an enterprise by means of appropriate security controls, 1 Credit

CB8102 Cybersecurity Risk Management

This course gives an overview of internal and external cybersecurity risks to organizations and how they can be managed. It outlines the tactics, techniques, and procedures of threat actors, as well as their motivations and intent. It covers risk assessment, analysis, management, and treatment—as well as the frameworks, international standards, and guidelines that regulate these practices. It explains methods of equipping organizations to make informed business risk decisions, depending on their industries and the maturity level of their security programs. 1 Credit

CB8103 Cyber FWs, Gov., and Compliance

This course gives an overview of the regulatory and industry-driven frameworks that govern an organization's cybersecurity program. Topics covered include the governance, risk, and compliance (GRC) concepts that apply to cybersecurity; the role of a Chief Information Security Officer (CISO), including its historical evolution; the implementation of cybersecurity governance within a business risk program; and methods of achieving cybersecurity compliance within an IT risk management program. 1 Credit

CB8104 Security Architecture

This course will explore the concept of security architecture in a time of change. Where traditional security architectures involved protecting the "perimeter" of the organization's network, many organizations are moving to cloud-hosted services. The course will cover the security architect's role in assessing what information can and should be stored in the cloud, and in setting up security infrastructure—as it applies to IT networks, data protection, security monitoring, and auditing. 1 Credit

CB8105 Fundamentals of Security Technologies

This course provides an overview of the technology that is fundamental to an organization's cybersecurity program and considers how it can best be deployed. It focuses on the principles of identity security and access management (IAM) as well as the protection of data, the world's modern currency. Concepts covered include role-based access, access modeling, trust models for access control, privileged account management, credential management, and authentication. The course will also discuss the way innovation works in cybersecurity. 1 Credit

CB8201 Privacy, Law and Ethics

This course examines the legal and ethical aspects of the relationship between privacy and cybersecurity. The legal and ethical obligations of cybersecurity professionals, and of organizations, with respect to privacy and personal information protection are explored. Key conceptual ideas, such as treating privacy and security as a “zero-sum” game, privacy by design and by default, and ethical programming are reviewed and discussed. No prior knowledge of law or ethics is required. 1 Credit

CB8202 Sec. Ops Business Cont. Disaster Recovery

Principles and practices of enterprise continuity and disaster recovery are presented with respect to cybersecurity operations within an enterprise framework, using the elements of cyber resilience: prepare/identify, protect, detect, respond, and recover as teaching principles. 1 Credit

CB8203 Cyber Simulations in the Cyber Range

This course provides an overview and survey of multiple cyber security frameworks and implements these frameworks practically in the Catalyst Cyber Range: a unique cybersecurity training and testing platform that provides immersive and ultra-realistic experiential learning opportunities. The Catalyst Cyber Range features a customizable technology platform and an array of real-world cybersecurity scenarios. This course focuses on the technical areas of the enterprise, incident response, penetration testing, cybersecurity operations, digital forensics and network security. The NIST Cybersecurity, Mitre ATT&CK and Cyber Kill Chain frameworks are applied in multiple cyber scenarios. 1 Credit

CB8204 Software Development Security

This course provides an overview of Software security that along with cryptography, access control and security protocols is fundamental to an organization’s cybersecurity program. The course focuses on the main sources of insecurity in software including software flaws as unintentional source of insecurity and malware as the intentional source, and discusses how the flaws and malware can be exploited through software reverse engineering (SRE). The course also covers main concepts of security in operating systems (OS) including security. 1 Credit

CB8205 Network Security

With the growing use of online distributed processing, secure access to computing infrastructure is of paramount importance that can be ensured by the network security. This course explores concepts, tools and services necessary to achieve network security design. It discusses authentication and IPSec VPN including site-site VPN. It explains protection of the network through access control and firewall. The modern networks face enormous attacks by intruders... The course assumes a working knowledge of cryptography. 1 Credit

CB8206 Applied Cryptography

This course provides a rigorous treatment of modern applied cryptography, emphasizing both theoretical foundations and practical applications. Topics include advanced symmetric and asymmetric cryptosystems, cryptographic hash functions, message authentication codes, digital signatures, key management protocols, and advanced cryptographic protocols such as zero-knowledge proofs and secure multi-party computation. The course also explores real-world applications and current research trends in areas such as blockchain technologies, privacy-preserving computation, and post-quantum cryptography. 1 Credit

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DATA SCIENCE AND ANALYTICS

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		**Credits**
Thesis		Milestone
DS8001	Design of Algorithms and Programming for Massive Data	1
DS8002	Machine Learning	1
DS8004	Data Mining and Prescriptive Analytics	1
DS8016	Directed Studies	Pass/Fail
Two Elective credits.		2

OR

Major Research Paper (MRP)		Milestone
DS8012	Research Skills	Pass/Fail
DS8005	Soft Skills, Communication and Ethics	Pass/Fail
DS8001	Design of Algorithms and Programming for Massive Data	1
DS8002	Machine Learning	1
DS8003	Management of Big Data and Big Data Tools	1
DS8004	Data Mining and Prescriptive Analytics	1
Two Elective credits.		2

ELECTIVES

BP8113	Advanced Imaging	1
CP8202	Advanced Software Engineering	1
CP8203	Advanced Database Systems	1
CP8206	Soft Computing and Machine Intel	1
CP8304	Distributed Systems	1
CP8305	Knowledge Discovery	1
CP8311	Genetic Programming	1
CP8314	Advanced Artificial Intelligence	1
DS8006	Social Media Analytics	1
DS8007	Advanced Data Visualization	1
DS8008	NLP (Text Mining)	1
DS8009	Special Topics in Data Science and Analytics	1
DS8010	Interactive Learning in Decision Process	1
DS8011	Bayesian Statistics and Machine Learning	1
DS8013	Deep Learning	1
DS8014	Graph Mining	1
DS8015	Machine Learning non Data Science Student	1
EF8903	Applied Econometrics	1
EF8913	Empirical Topics in International Finance	1
EF8914	Financial Econometrics	1
EF8933	Empirical Topics Int'l Trade	1
EF8937	Labour Economics	1
EF8944	Panel Data and NL Model Analysis	1
EF8945	Nonparametric Data Analysis	1
ME8118	Info Sys Analysis & Design	1
ME8127	Optimization Models	1
ME8140	Simulation Theory/Methodology	1
MT8310	Special Topics Info Sys Mgmt	1
SA8901	Geospatial Data Analytics	1
SA8911	Geodemographics	1

COURSE LISTING

Thesis
The student is required to conduct advanced research on a topic related to data science. The topic is chosen in consultation with thesis supervisor, and the student presents research plan in writing before research starts. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the thesis. The student is expected to furnish evidence of competence in research and a sound understanding of data science associated with the research. This is "Milestone".

Major Research Project
The student is required to conduct an applied advanced research project. The project will be carried out under the guidance of a supervisor. On completion of the project, the results are submitted in a technical report format to an examining committee and the student will make an oral presentation of the report to the committee for assessment and grading of the report. The student is expected to provide evidence of competence in the carrying out of a technical project and present a sound understanding of the material associated with the research project. This is a "Milestone."

DS8001- Design of Algorithms and Programming for Massive Data
NP-completeness, approximation algorithms and parallel algorithms. Study of algorithmic techniques and To introduce students to the theory and design of algorithms to acquire and process large dimensional data. Advanced data structures, graph algorithms, and algebraic algorithms. Complexity analysis, complexity classes, and modeling frameworks that facilitate the analysis of massively large amounts of data. Introduction to information retrieval, streaming algorithms and analysis of web searches and crawls. 1 Credit

DS8002 – Machine Learning
Overview of artificial learning systems. Supervised and unsupervised learning. Statistical models. Decision trees. Clustering. Feature extraction. Artificial neural networks. Reinforcement learning. Applications to pattern recognition and data mining. 1 Credit

DS8003 – Management of Big Data and Big Data Tools
The course will discuss data management techniques for storing and analyzing very large amounts of data. The emphasis will be on columnar databases and on Map Reduce as a tool for creating parallel algorithms that can process very large amounts of data. Big Data applications, Columnar stores, distributed databases, Hadoop, Locality Sensitive Hashing (LSH), Dimensionality reduction, Data streams, unstructured data processing, NoSQL, and NewSQL 1 Credit

DS8004 Data Mining and Prescriptive Analytics
The course teaches to use data to recommend optimum course of action to achieve the optimum outcome and to formulate new products and services in a data driven manner. The course will cover all these issues and will illustrate the whole process by examples. Special emphasis will be given to data mining and computational techniques as well as optimization and stochastic optimization techniques. Prerequisite: DS8002 1 Credit

DS8005 Soft Skills, Communication and Ethics
The course will focus on communicating and presenting data analytics and modeling results. It aims at building the competency in story telling from numbers. The course also covers ethical and social impacts of data science, analytics and AI. Prerequisite: DS8012 Pass/Fail

DS8006 Social Media Analytics
The course will cover fundamental concepts and tools in Social Network Analysis by showing how AI, math, and statistical methods are used to study them. The topics include: weblog analysis, centrality in social networks, influence, sentiment analysis and opinion mining, information cascades, multimedia analysis, reasoning and prediction with social media and modeling behaviour. The lab component of the class will use R or Python to develop and analyze network models. Prerequisite: DS8002 1 Credit

DS8007 Advanced Data Visualization
Overview of data visualization. Basic visualization design and evaluation principles. Learn to acquire, parse, and analyze large datasets. Techniques for visualizing multivariate, temporal, text-based, geospatial, hierarchical, and network/ graph data using tools such as ggplot2, R, D3, etc. 1 credit

DS8008 NLP (Text Mining)
The course covers important topics in text mining including: basic natural language processing techniques, document representation, text categorization and clustering, document summarization, sentiment analysis, social network and social media analysis, probabilistic topic models and text visualization. Prerequisites: DS8002 and DS8003 1 credit.

DS8009 Special Topics in Data Science and Analytics
This course consists of lectures, seminars and readings covering the latest advances and research in data science and analytics. The course description will be announced prior to scheduling of the course. 1 credit.

DS8010 Interactive Learning in Decision Process
This course focuses on topics related to reinforcement learning. The course will cover making multiple-stage decisions under uncertainty, heuristic search in planning, Markov decision processes, dynamic programming, temporal-difference learning including Q-learning, Monte Carlo reinforcement learning methods, function approximation methods, and the integration of learning and planning. Other topics can be included as well. Prerequisites: DS 8002 1 Credit

DS8011 Bayesian Statistics and Machine Learning
This course will cover modern machine learning techniques from a Bayesian probabilistic perspective. Bayesian probability allows us to model and reason about all types of uncertainty. The result is a powerful, consistent framework for approaching many problems

that arise in machine learning, including parameter estimation, model comparison, and decision making. We will begin with a high-level introduction to Bayesian inference, then proceed to cover more-advanced topics. Prerequisites: DS 8002 1 Credit

DS8012 Research Skills
This course will be an introduction to research preparation, experimental design, methods of data collection, exploratory data analysis, and understanding threats to validity of results with aim to prepare student for MRP work. Pass/Fail

DS8013 Deep Learning
The course aims to present the mathematical, statistical and computational challenges of building stable representations for high-dimensional data, such as images, text and data. The topics include: Convolutional neural networks. Autoencoders, their sparse, denoising variants, and their training. Regularization methods for preventing overfitting. Stacked autoencoders and end-to-end networks. Recurrent and recursive networks. Multimodal approaches. Deep architectures for vision, speech, natural language processing, and reinforcement learning. Prerequisite: DS8002. 1 Credit

DS8014 Graph Mining
The course aims to present the mathematical, statistical and computational challenges of building stable representations for high-dimensional data, such as images, text and data. The topics include: Convolutional neural networks. Autoencoders, their sparse, denoising variants, and their training. Regularization methods for preventing overfitting. Stacked autoencoders and end-to-end networks. Recurrent and recursive networks. Multimodal approaches. Deep architectures for vision, speech, natural language processing, and reinforcement learning. Prerequisite: DS8002

DS8015 Machine Learning non Data Science Student
This course will introduce students to the theory and design of machine learning algorithms using Python. The course will cover Python Fundamentals, Data Structures, Functions and Functional Programming, Python Libraries, Exploratory Data Analysis, Statistical Inference, Introduction to Machine Learning, Unsupervised Learning, Supervised Learning: Regression, Supervised Learning: Classification, Dimensionality Reduction. 1 credit

DS8016 Directed Studies
This course assists the student with the development of the Thesis through the proposal, preliminary literature review, outline, and reporting stages. It is tailored to the needs of each student and the work in this course will be used as a foundation for the Thesis. Students are required to select an advisor and present a formal report, or take a formal examination, at the end of the class. Directed studies course is a prerequisite for starting Thesis work, and requires approval from PD. Pass/Fail

For course descriptions of non DS courses, go to the Program offering the course. BP – Biomedical Physics CP – Computer Science EF – Economics ME – Mechanical and Industrial Engineering MT – Master of Science in Management SA – Spatial Analysis

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DIGITAL MEDIA

First offered in Fall 2013
Revision 2025

CURRICULUM

Master of Digital Media

DEGREE REQUIREMENTS		**Credits**
DG8001	Foundations of Digital Media	1
DG8002	Digital Media Environments	1
DG8004	Digital Media Entrepreneurship	1
DG8011	Collaborative Workshop Research Design	Pass/Fail
AND one of the following options		
MRP Option		
Major Research Paper		Milestone
DG8012	MRP in Digital Media	Pass/Fail
DG8009	Directed Studies	1
3 elective		3
OR		
Course Only Option		
7 electives		7
OR		
Capstone Option		
Capstone Major Research Project/Paper		Milestone
Self-Reflection Document		Milestone
DG8012	MRP in Digital Media	Pass/Fail
4 electives		4

Electives		**Credits**
DG8003	Interaction Design Digital Media	1
DG8005	Interpersonal Communication	1
DG8008	Business and Mgnt. in Digital Media Industry	1
DG8009	Directed Studies	1
DG8010	Selected Topics in Digital Media	1
DG8111	Digital Publishing	1
DG8112	Physical Computing	1
DG8113	Field Placement	1
DG8114	Human-Robot Interaction	1
DG8115	Themed Entertainment Design and Technology	1
DG8116	Zone Learning Project I	1
DG8117	Introduction to Game Design	1
DG8118	User Experience Design	1
DG8119	AR/VR in Practice, Immersive Realities	1
DG8120	Intro to Tangible Media	1
DG8301	Funding New Ventures	1
DG8302	Creating a Business Plan	1
DG8306	Digital Project Lab	1

COURSE LISTING

Major Research Project/Paper
This 6 month long project will provide students with the team-based opportunity to focus on a major project over the course of one-and-a-half semesters. Students following the Industrial Focus stream will pursue industry relevant projects. Students following the Entrepreneurial Focus stream will work on a project that has the potential to become a commercial product or a service, and that could lead to the development of a standalone company. Those students following the Art/Design stream will work on projects with that particular focus. A written project document will also be a required outcome of this course. Prerequisite: Successful completion of Collaborative Workshop. This is a Milestone.

DG8001 Foundations of Digital Media
Business, technological, social, legal and ethical issues and the many forms of digital entertainment are introduced and framed. The emergence and ongoing development of the digital entertainment industry is discussed through a historical exploration and critical analysis of the economics, technical innovations, social demands and ethical constraints that define it. There is a focus on the range of careers and professional opportunities in this rapidly expanding sector. Outcomes are exploration and a critical perspective on digital entertainment and other fields of digital media such as health, education, advertising, and social media. This exploration will act as a common basis for all subsequent discussion and collaboration between students with artistic, technical or interdisciplinary backgrounds. 1 Credit

DG8002 Digital Media Environments
This production-oriented course provides an introduction to the landscape of digital media environments, the audiences they serve, and the platforms through which they are typically delivered. The course then introduces regulations and standards, interaction design and production skills, an exploration of the project development cycle, project management, project evaluation and user testing. Concept design of websites, computer games, and other networked, ambient screen-based and non-screen-based displays, and or mobile applications or appliances, including the general concept of "the internet of things", are explored through a series of brief, hands-on projects. 1 Credit

DG8003 Interaction Design Digital Media
This course will introduce students to the fundamental frameworks for the design of popular digital media environments. Specifically, the course will analyze formative elements and strategies adopted in game design, social networking and interactive digital media systems, including interaction design with a variety of devices, platforms and media. Key components explored include user engagement, immersion, visual narrative, interactive storytelling, performance, user cognition and perception. Students will develop a solid understanding of how these environments work, inclusive of alternative design strategies, how users interact, and what is required to create such environments. Students will perform project work in small teams. 1 Credit

DG8004 Digital Media Entrepreneurship
This course will help students better understand digital media industry sectors, basic competitive strategies and business models, and the process of considering, planning for and gathering resources to launch an entrepreneurial start-up company in the digital media sector. Students will develop an understanding of activities involved in developing, producing and marketing digital media to consumers, components of a company's market and competitive strategic positioning and business model, elements of a viable business plan for a startup company, and how to communicate elements of the business plan to outside parties for support or for provisioning of resources. Students will perform project work in small teams. 1 Credit

DG8005 Interpersonal Communication
Digital media professionals need to communicate their ideas clearly and persuasively and work with teams of creative, technical, and business people. Building effective interdisciplinary teams requires skills in improvisation, listening effectively, engaging diverse audiences, and inviting and resolving conflicts. This interactive, workshop-based course focuses on interpersonal communication skills and public speaking. For greater self-awareness and improvement, course speeches are digitally recorded. 1 Credit

DG8008 Business and Mgnt. in Digital Media Industry
This course gives students an overview of the interrelated factors making up the business environment including ethics, operations, marketing, management, leadership, accounting, human resources, finances and information technology management. In addition, the student learns about past, present and future trends in business. The student develops decision-making and problem-solving skills through case studies, group exercises and presentations. Topics covered also include production, delivery and management of digital media and how games, film and music businesses differ from traditional businesses. 1 Credit

DG8009 Directed Studies
This course is available to graduate students who wish to gain knowledge in a specific area for which no graduate-level courses are available. The course is taken under the guidance of a faculty member, and students are required to present a formal report, or take a formal examination, at the end of the course. The program of study must be approved by the supervising faculty member and the program director at the beginning of the term of study. 1 Credit

DG8010 Selected Topics in Digital Media
An in-depth analysis of recent developments and topics of current interest in Digital Media. The topic is selected every year in accordance with industry trends, the interest of students and availability of faculty expertise. The course will focus on strategic and novel topics and concepts in Digital Media which may include, but are not limited to: Ambient and Artificial Intelligence, Social Networking Analysis and Design, Social Media and its Frameworks, Advanced Concepts in 3D Graphics and Visual Effects, Multimedia Syndication and Segmentation and Unified Communications in Multimedia Systems, and Information Security and Privacy. 1 Credit

DG8011 Collaborative Workshop & Research Design
This course focuses on the fundamental concepts and skills required to successfully manage projects in dynamic, agile, multidisciplinary team environments relevant to digital media. This course also introduces research design and planning as it relates to digital media. The course examines a variety of research methodologies including creative, practice-based research and covers the various components of research from the formulation of research questions to the analysis and interpretation of data. Pass/Fail

DG8012 MRP in Digital Media
This course focuses on the execution of research for the major research project (MRP). Research methods including creative, practice-based research will be reinforced and executed with the guidance of a supervisor. This course encompasses strategic milestones throughout, concluding with a formal presentation and a comprehensive written major research paper (and project if applicable). Prerequisite: DG8011 Pass/Fail

DG8111 Digital Publishing
This course will focus on strategic and novel topics and concepts in Digital Media which may include, but are not limited to: Ambient and Artificial Intelligence, Social Networking Analysis and Design, Social Media and its Frameworks, Advanced Concepts in 3D Graphics and Visual Effects, Multimedia Syndication and Segmentation and Unified Communications in Multimedia Systems, and Information Security and Privacy. Antirequisite: LM8910. 1 Credit

DG8112 Physical Computing
Using the human body and our senses (vision, acoustic, touch, taste, smell, proprioception – physical sense of self movement) as an organizing model, this course introduces students to Physical Computing practices. Students will learn about digital and analog sensor systems, be introduced to micro-controllers, computer sensor systems and ubiquitous computing. Antirequisite: MP8987. 1 Credit

DG8113 Field Placement
Field Placements provide opportunities for full time, non-practitioner students to earn academic credit for relevant work experience (paid or unpaid), normally outside the university. They must be related to Digital Media and to the student's learning objectives in the program. Field Placements offer students the opportunity to link theory with practice, to conduct research, to learn about professional practices in organizations in the field of digital media and to gain work experience. 1 Credit.

DG8114 Human-Robot Interaction
From the first moment a human picked up a stick and attempted to knock down some food from an unreachable location we have attempted to use technology to extend our influence in the world. This course will examine physical systems designed to extend the notion of human presence to remote locations. Topics may include Presence, Telepresence, Tele-robotics and Agency. The course is designed to provide students with a practical introduction to HRI that will involve the design and construction of working robotic systems designed to interact with remote environments. Prerequisite: CPS607 or permission of the instructor. 1 Credit

DG8115 Themed Entertainment Design and Technology
This course provides an intensive overview including the history and evolution of themed environments and attractions, design objectives and approaches, industry structure and professional spectrum, and innovation framework. Lectures, seminars, readings, tours, guests, and field trip options will be adapted to student interests. Students will explore, develop, and present or demonstrate a topic of interest related to ride, show, or guest experience. 1 Credit

DG8116 Zone Learning Project I
This structured experiential learning opportunity allows students to focus on a project within one of Ryerson University's Zones. Students will improve their knowledge through engaged experiential learning while developing their social and collaborative skills. Students will set milestones with the instructor based on their personal interests and project needs, meet regularly to determine progress and adjustments, discuss relevant theories and methodologies in class, and share accountability-rep. 1 Credit

DG8117 Introduction to Game Design
In this course, you will employ research creation methodologies to create professional quality games and interactive experiences. 1 Credit

DG8118 User Experience Design
Technology and User interfaces are changing dynamically. It is critical for designers to understand a tested design process that can be used for emerging technologies. This course uses design thinking models, creative techniques and software to empathize with the end user, define the problem, ideate possible solutions, prototype a minimum viable product (MVP) and iterate after user testing. 1 Credit.

DG8119 AR/VR in Practice, Immersive Realities
In this comprehensive course, students will gain a profound understanding of the design principles and development considerations that encompass virtual reality (VR), augmented reality (AR), and mixed reality (MR) applications, but also delve into the fundamentals of crafting virtual environments in Unreal for desktop and VR experiences. 1 Credit

DG8120 Intro to Tangible Media
Using the human body and its senses (vision, acoustic, touch, taste, smell, proprioception - physical sense of self movement) as an organizing model, this course introduces students to Physical Computing practices. Students will learn about digital and analog sensor systems, be introduced to micro-controllers, computer sensor systems and ubiquitous computing. Basic programming skills are an important part of this course. 1 Credit

DG8301 Funding New Ventures
Entrepreneurial finance is concerned with financial decisions of entrepreneurs and entrepreneurial firms, capital structure decision-making and governance issues in high-risk environments, and the ways to exit venture investments. The rapid development of private equity and venture capital industries, and the general emphasis of entrepreneurship as a central driver of economic prosperity, has given rise to a set of questions that are different from the questions posed in the context of large firms with widely diversified investors. This course will address these questions using both explicit-knowledge lectures as well as tacit-knowledge experiential learning. This course is designed for students who are thinking about pursuing a career as an entrepreneur or who envision a career in the private equity, venture capital, or investment banking industries where they will be exposed to deals with small to mid-sized firms. Antirequisite: FIN 510, ENT511. 1 Credit

DG8302 Creating a Business Plan
The objective of this course is to have the student become familiar with preparing a professional business plan for a new venture. The preparation of the business plan will be built upon everything that has been learned to date and will require the synthesis of this learning. The course will provide the student with the opportunity to explore and investigate a business venture of interest and the preparation of a business plan will provide an opportunity to apply what has been learned in the business program. The student will

also develop an appreciation for the requirements of a successful entrepreneurial venture. Antirequisite: BOC 913, ENT 500, ENT726. 1 Credit.

DG8306 Digital Project Lab
This course offers a unique opportunity to build a digital project with a full interdisciplinary team. Students from multiple disciplines/programs form teams to develop functional digital prototypes. Projects will be cutting-edge Mixed Reality work including wearable technology, location- and context-aware computing, socially-connected apps, and novel interaction paradigms. Teams work closely with professors and mentors to learn new production-skills in digital creativity, collaborative work, programming, demo videos, documentation, and presentation skills. Antirequisite: MP8986, CPS630. 1 Credit

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DOCUMENTARY MEDIA

CURRICULUM

Master of Fine Arts

DEGREE REQUIREMENTS		**Credits**
Major Research Project		Milestone
DM8102	Documentary Studies I	1
DM8103	Documentary Studies II	1
DM8108	Documentary Research Methods	1
DM8215	Fundamentals of Media I	2
DM8216	Fundamentals of Media II	2
DM8225	Master's Project Development I	2
DM8226	Master's Project Development II	2
DM8235	Master's Project Production I	2
DM8236	Master's Project Production II	2
DM8905	Professional Perspectives	1
One Advanced Theory elective		1
One Communication & Design elective		1

ELECTIVES

Advanced Theory		**Credits**
DM8301	Adv Topics in Documentary Media	1
DM8302	Cult of Avt Grde Mdrns Discnts	1
DM8303	Hist/Historiography: Vis Arts	1
DM8305	Dbs, Arcs, Virt Exprnce of Art	1
DM8307	Representational Media	1
DM8309	Directed Studies: Advanced Theory	1

Communication & Design		**Credits**
CD8310	Topics in Cross-Cultural Comm	1
CD8320	Media Langs: Forms & Apprches	1
CD8330	Audiences and the Public	1
CD8340	Media Writing: Critical & Narrative Forms	1
CD8350	Socially Engaged Media	1
CD8351	Documentary as Oppositional Practice	1

COURSE LISTING

Master's Project
The master's project milestone is the development and preparation of a visual project in documentary form. It may be presented in photographic, film, digital video or digital interactive format. It must demonstrate professional competence in the chosen medium/format, must be produced under the student's sole creative control in consultation with faculty advisors, and must be accompanied by a written paper, which provides a project synopsis and critical analysis. Students also prepare a brief talk on their project. This is a "Milestone". Pass/Fail.

DM8102 Documentary Studies I
The first in a two-course sequence in the traditions, methods and applications of documentary forms, this course will instruct students in the fundamental principles of authorship and creation of documentary artifacts. Emphasis will be placed on the history of the documentary approach, applied subject research, the development of structure, and image capture techniques and applications. The course will be supplemented with a required series of screenings, exhibitions and visiting artist lectures; these activities will provide a social and cultural context for understanding the many roles undertaken or assumed by documentary media in defining the present era. 1 Credit

DM8103 Documentary Studies II
This is the second course in a two-course sequence in which students gain an understanding of the traditions, methods, strategies and theories of documentary media. Recent theoretical debates and critical writing on documentary media will be used to contextualize documentary practice and to open questions concerning documentary truth and meaning; documentary disclosure and doubt; representation and reality; the ethical treatment of subjects and the emergence of new media forms. The screenings, exhibitions and lectures associated with Documentary Studies I will continue into the second term of the program as a requirement for this course. 1 Credit

DM8108 Documentary Research Methods
Students are introduced to the research methods used in documentary practices such as the interview, sensory ethnography, and Indigenous research methodologies. The course familiarizes students with the research and information gathering process, with the use of the library and the archive, online research, and creative research strategies. The course also provides an introduction to project design and the writing of research proposals.
1 Credit

DM8215 Fundamentals of Media I
This is a first in a series of production courses designed to overview the fundamental elements of visual media. The emphasis is on creating a relationship between formal and compositional elements of images and their content. Theoretical ideas are placed against practical context of production methods and techniques including still image making, motion picture, and new media approaches. Antirequisite: DM8105 2 Credits

DM8216 Fundamentals of Media II
This course will continue with an overview of the fundamental tools of image making at an intermediate level. The relationships between documentary, representation, and construction are explored further and include a refinement of methods and techniques introduced in the first production course. Antirequisite: DM8104. 2 Credits

DM8225 Master's Project Development I
This course is the first in a sequence of seminars designed to assist students in conceiving, articulating and producing their final projects. The course will explore documentary practice in relation to student project objectives, focusing on the principal stages in documentary production, including: planning, research, timelines, budgets, shooting, sequencing, editing and finishing. Critical, creative and production strategies will be examined in a variety of production contexts. Antirequisite: DM8101 Pass/Fail. 2 Credits

DM8226 Master's Project Development II
This is an advanced production course that focuses on specific methods and techniques of editing images, motion picture, sound, or interactive experimental approaches in contemporary documentary-based practice. Various production and post-production strategies are reviewed. This is a hands-on course designed to prepare for graduate fieldwork and production of the MFA final project. Antirequisite: DM8106. Pass/Fail. 2 Credits

DM8235 Master's Project Production I
This is the first of two sequential courses focused on the production phase of the final Milestone requirement in the MFA, the Major Research Project. Antirequisite: DM8901. Pass/Fail. 2 Credits

DM8236 Master's Project Production II
This is the production phase of the final course requirement in the MFA curriculum, the Master's Project. Pass/Fail.
2 Credits.

DM8301 Advanced Topics in Documentary Media
Documentary work can be understood in terms of an aesthetic and philosophical engagement with the ever-changing epistemological status of the form itself. What started out as a response to fiction or an adjunct to the dominant form now seems to have merged, in the audience's eyes at least, into some sort of hybrid, postmodern comment on reality. This course will undertake a study of documentary's truth claims in the 21st century. Informing this survey of contemporary works will be the seminal theoretical works that have mapped out the precarious philosophical terrain the form insists on cultivating. 1 Credit

DM8302 The Culture of Avant-Garde: Modernity's Discontents
This course explores the discontent that members of vanguard artistic movements of the 20th century harbored relative to the culture of modernity, and examines the different forms that this discontent (or protest) assumed in Futurism, Dada, Surrealism, Lettrism and Situationism. The course examines both key documents in cultural theory and the manifestos issued by various groups, and is concerned particularly with artists who attempted to forge a link between political revolution and a revolution in consciousness. The role the cinema played in all these artistic movements is given special consideration, as is the re-contextualization of this work as a document of its own culture and time. Antirequisite CC8983. 1 Credit

DM8303 History and Historiography: Critical Studies in the Visual Arts
A directed reading, seminar course examining recent developments in historical and critical studies across all media, with an emphasis on investigating developments in the fields of cultural studies which utilize contemporary visual media as primary source material. The ever-expanding literature related to documentary forms and practices, as well as the changing historical roles of these forms, will be another essential subject of investigation. 1 Credit

DM8305 Databases, Archives and the Virtual Experience of Art
Visual information takes on different forms in the digital realm, and multifaceted databases accumulate more and more of this information. Our perceptual and social understandings of images -- even our cultural identities and memories -- are increasingly stored in systems through which only reproductions and virtual images can be retrieved. This course examines the larger implications of this phenomenon for image makers as well as for societies and cultures. 1 Credit

DM8307 Mirror, Prosthesis, Storage Device: Representational Media and Epistemologies
What are media and how do they shape and contain knowledge? This course critically engages with a history of ideas about the nature of the document. Students will work through a body of philosophical and theoretical writings from the ancient and contemporary worlds that consider media as mirror to nature, as prostheses or extension of the human body, as storage device, and as communication system, in conjunction with examples drawn from art, literature, photography, film, and new media. 1 Credit

DM8309 Directed Studies: Advanced Theory
1 Individual directed study of subject areas in Documentary Studies: Advanced Theory not addressed in the current curriculum will be carried out under the supervision of a faculty member. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. 1 Credit

DM8310 Directed Studies: Communication and Design
Individual directed study of subject areas in Documentary Studies: Communication & Design not addressed in the current curriculum will be carried out under the supervision of a faculty member. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. 1 Credit

DM8905 Professional Perspectives
The Master Class Seminar provides students with an opportunity to learn from outstanding professionals working in documentary media including film, new media and photography. Each class features one guest who brings their personal experience into an intimate, hands-on discussion on subjects such as photography, cinematography, directing, editing, digital imaging and interactive and installation work. Pass/Fail 1 Credit

Communication and Design Electives
see COMMUNICATION AND DESIGN SECTION

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EARLY CHILDHOOD STUDIES

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		Credits
Master's Research Paper*		(Milestone)
CS8901	Research Design for ECS	1
CS8904	Theoretical Frameworks for Childhood Studies	1
Five elective credits		5

* Students may apply to substitute three courses for the Master's Research Paper

ELECTIVES		Credits
CS8902	Pedagogy and Curriculum	1
CS8903	Children Families Communities	1
CS8922	Leadership-Educational Change	1
CS8923	Social Justice and Childhood	1
CS8924	Inclusion: Issues in Assessment	1
CS8926	Risk and Resilience	1
CS8928	Transformative Literacy	1
CS8929	Minority-Language Children	1
CS8930	Social Research with Children	1
CS8931	Children and Canadian Policies	1
CS8932	Children and Play	1
CS8933	Directed Studies in ECS	1
CS8934	Special Topics in ECS	1
CS8935	Program Evaluation	1
CS8936	Children's Rights	1
CS8937	Queering Education	1
CS8938	Cross-cultural Development	1
CS8939	Re-conceptualizing ECEC	1
CS8940	Indigenous Early Learning	1
CS8941	Internship	1
CS8942	Children's Health	1
CS8943	Eco Curric Pedagogy and Research	1

COURSE LISTING

Master's Research Paper
Students will conduct research on a topic of their choice related to early childhood studies; produce a scholarly paper under supervision of a faculty member; and orally defend their work before a committee. The Master's Research Paper is a "Milestone." Pass/Fail

CS8901 Research Design for Early Childhood Studies
In this course, students will learn about how knowledge is created, advanced or challenged, and shared with others. They will consider selected research approaches, strategies, data collection instruments, analytical processes, and forms of dissemination based on various purposes and audiences. They will develop a proposal for a small scale research project and be able to offer rationales for their methodological decisions. 1 Credit.

CS8902 Pedagogy and Curriculum
Students will grapple with theories and provocations for thinking with curriculum and pedagogy relevant to the political complexities of 21st century childhoods. They will activate pedagogy and curriculum-making as responses to contemporary inheritances and conditions, and as ethical commitments toward living well with children in precarious times. 1 Credit

CS8903 Children Families Communities
Students will learn theories and strategies to recognize and challenge educational practices that disadvantage children and families because of cultural, language, race, religion, socio-economic class or other "differences". 1 Credit

CS8904 Theoretical Frameworks for Childhood Studies
Students will be introduced to a number of major theoretical frameworks drawn from a variety of fields and disciplines. Implications of these frameworks (e.g. developmentalism, feminism, post-modernism, queer theory, critical theory, post-colonialism, anti-racism, etc.) for research and practice in early childhood studies will be considered. 1 Credit

CS8922 Leadership-Educational Change
Educational change processes in the contexts of families, childcare, schools, communities, governments, and societies will be examined. The skills and roles of leaders who promote systemic changes will be discussed. 1 Credit

CS8923 Social Justice and Childhood
In this course students will explore theories of social justice and their implementation within Childhood and as social practice. The role of language, social movements and discourse in constructing inclusive or exclusive spaces for children will be explored. Through the lens of childhood studies, students will examine theories and ideologies to develop a critically informed knowledge base for the pursuit of social justice as an explicit and necessary social practice. 1 Credit

CS8924 Inclusion: Issues in Assessment
This course will discuss individual, group, and environmental assessments in the field of early childhood studies (birth to age 8). Students will also examine issues of equity related to assessment practices, particularly for children with disabilities. Theoretical frameworks for understanding assessment practices will be informed by the research literature, and students will become familiar with a number of assessment tools such as the Early Development Instrument (EDI). 1 Credit

CS8926 Risk and Resilience
The construct of resilience and factors that contribute to healthy outcomes for children in the face of risk and adversities will be examined. Students will consider societal, institutional, familial, and individual factors that pose risks for healthy childhood development, and identify points of invention. Theories of resilience will be examined with an emphasis on how diverse social and cultural experiences shape pathways to adulthood. 1 Credit

CS8928 Transformative Literacy
Transformative literacy challenges mainstream practices of literacy and inequities in education through critical pedagogy. It empowers voice through expression of self in relation to the world and is inclusive of children and families from diverse backgrounds. This course introduces students to transformative literacy concepts and approaches including: holistic education, multi-literacies, multiple and multimodal literacies. This course will offer the opportunity to participate in transformative literacy initiatives. 1 Credit

CS8929 Minority-Language Children
This course provides an overview of bilingual education for young minority-language children. The course explores educational and socio-political dimensions of bilingual education; minority-language education in Canada (immersion, Indigenous languages, sign languages, heritage languages); and case studies from around the world. Students will have the opportunity to investigate their own areas of interest in bilingual education for young minority-language children, draw on appropriate theories and research methods, and present their research in a final project. 1 Credit

CS8930 Social Research with Children
Building on the core course in research design, this course will focus on current debates and discussions regarding research that involves children. Methodological and ethical issues such as informed consent, children as collaborators in the research process, and power issues in social research with children will be considered. 1 Credit

CS8931 Children and Canadian Policies
This course will critically examine a wide range of Canadian social policies that touch the lives of young children. Policies that impact children's health, care, education, family life, and future well-being will be evaluated. The course will include the assessment of public policies that specifically affect Indigenous children and public policies that specifically affect immigrant and refugee children. The beliefs and values that form the foundation for present policies will be clarified. Options for future policy development will be discussed. 1 Credit

CS8932 Children and Play
Children's play is primarily mediated by adult philosophical, ideological, social, pedagogical and cultural agendas, with children's own goals, interest and needs at the margins. This course explores the research and literature around the conceptualization and creation of tools and methods that foster child-initiated play, as a form of inquiry into physical and sensory phenomena. 1 Credit

CS8933 Directed Studies in ECS
This course is for Masters Students who wish to gain knowledge in a specific area for which no graduate level class is offered. Students arrange to work with an individual faculty member on a course designed by the student and the faculty in a specific area that is relevant to Early Childhood Studies. 1 Credit

CS8934 Special Topics in ECS
This course provides students with the opportunity to pursue advanced studies on issues and themes of immediate and current significance in the fields of Early Childhood Studies. It allows students to access leading-edge research and to explore new and emerging models of practice. The particular theme, topic and structure of the course will vary in response to changes and trends in the field, availability of specialists and student interest. 1 Credit

CS8935 Program Evaluation
This applied social research course introduces the principles and methods of evidence-based practice (EBP) in human service programs. Topics to be addressed include research design, methods of data collection, interpretation of statistics and the use of

requests for proposals as a component of program evaluation. The course includes discussions of studies from the current literature, including work from peer-reviewed journals as well as work by human service agencies, government ministries and NGOs. 1 Credit

CS8936 Children's Rights
The United Nations Convention on the Rights of the Child is examined. The convention is explored within the framework of human rights principles and citizenship. Policy and practice implications will be considered through the lens of a child rights approach. Consideration will be given to understanding children's development as citizens and children's participation in society. 1 Credit

CS8937 Queering Education
This course uses queer theory to explore how bodies negotiate their identities in social, cultural, political, and institutional contexts through an intersection of queer theory and education. Essentialist readings of the body as fixed and stable are disrupted using various queer theories to engage critical discussions of the body as mobile and fluid. The vision of this course is to create new spaces to rethink curriculum, teaching, and learning in early childhood studies. 1 Credit

CS8938 Cross-cultural Development
Cross-cultural Development: This course focuses on socio-cultural theories of child development. Students will critically examine cultural variations in the socialization of behavior, physical growth and development, language and cognition, personality and identity, sex and gender, families and other social relationships. 1 Credit

CS8939 Re-conceptualizing ECEC
This course will introduce students to the theoretical frameworks used in the re-conceptualizing Early Childhood Education and Care (ECEC) movement in Canada and beyond. They will have the opportunity to examine taken-for-granted notions of children and childhood, teachers and teaching, and the purposes of ECEC. 1 Credit

CS8940 Indigenous Early learning
Students will explore issues confronting Indigenous children and their families in Canada. Indigenous perspectives on the origins of these issues and the current environment are examined in the context of Indigenous self-determination. Course work focuses on issues from a national, provincial, and local perspective with discussions about world view, history, families, policy, and jurisdictional issues. Antirequisite: CLD450. 1.0 Credit

CS8941 Internship
This course involves a minimum 120 hour internship at an organization focusing on policies, service delivery, or advocacy related to early childhood studies. Students taking this course will attend seminars, design and undertake a project under the joint direction of the instructor and internship supervisor, and write a report based on the project that involves reflection on student learning and skill development. 1 Credit

CS8942 Children's Health
This course examines research and emerging issues associated with children's health and well-being. By adopting a holistic view of health, the impact of physical illness, mental health and social relationships are explored. A children's rights perspective that advocates for health promotion forms the conceptual framework upon which to explore notions of well-being. An examination of the social determinants of health provides an opportunity to consider the evolution of pediatric care and current risks to children. 1 Credit.

CS8943 Eco Curric Pedagogy and Research
This course explores the possibilities for curriculum, pedagogy, and research that is guided by ecological understandings of learning, knowing, acting, and being. Through engagement with theoretical texts and empirical works in ecologically informed curriculum, pedagogy, and research, the interconnectedness and complexity of systems that inform and guide theory and practice in the early years is critically analyzed.
1 credit

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ECONOMICS

CURRICULUM

Master of Arts – International Economics and Finance

DEGREE REQUIREMENTS		**Credits**
EF8100	Mathematics and Statistics Review	(Non-credit)
EF8901	Microeconomics	1
EF8902	Macroeconomics	1
EF8903	Applied Econometrics	1
EF8904	Financial Theory	1
One of the following:		
EF8911	International Finance (Field I - International Finance)	1
	OR	
EF8931	Int'l Trade Theory, Policy (Field II - International Trade & Policy)	1
Two elective courses (one may be the other field**)**		2

AND one of the following options

Master's Paper Option	(Milestone)
Master's Paper	
Internship Option	(Milestone)
Master's Internship	
Course Only Option	
One additional elective	1

ELECTIVES

EF8913	Empirical Topics in International Finance	1
EF8914	Financial Econometrics	1
EF8932	Int'l Trade-Imperfect Comp	1
EF8933	Empirical Topics Int'l Trade	1
EF8934	Global Inst and Int'l Economy	1
EF8935	Law/Reg-Int'l Trade and Invest	1
EF8936	International Public Economics	1
EF8937	Labour Economics	1
EF8938	Development Microeconomics	1
EF8939	Topics in Econometrics	1
EF8940	Environment Economics	1
EF8941	Topics in Dev Economics	1
EF8942	Industrial Organization	1
EF8943	Monetary Economics	1
EF8944	Panel Data and NL Model Analysis	1
EF8945	Nonparametric Data Analysis	1

Doctor of Philosophy - Economics
First Offered Fall 2010

DEGREE REQUIREMENTS		**Credits**
PhD Comprehensive Examination		(Milestone)
PhD Dissertation		(Milestone)
EF9100	PhD Seminar	(Non-credit)

EF9913	Primer, Mathematical Economics	(Non-credit)
	Core Courses: Compulsory	
EF9901	Advanced Microeconomics I	1
EF9902	Advanced Macroeconomics I	1
EF9903	Advanced Econometrics I	1
EF9904	Mathematical Economics	1
EF9921	Advanced Microeconomics II	1
EF9922	Advanced Macroeconomics II	1
EF9923	Advanced Econometrics II	1
7 Elective Courses		**7**

Group A (Choose minimum of 5)		**Credits**
EF9905	Advanced Topics in Int'l Trade I	1
EF9906	International Finance	1
EF9907	Game Theory	1
EF9908	Advanced Topics in Macro and Finance	1
EF9909	Numerical Methods in Economics	1
EF9910	Advanced Topics in Int'l Trade II	1
EF9911	Advanced Topics in Labour Economics	1
EF9912	Directed Studies in Economics	1
EF9914	Advanced Topics in Financial Econometrics	1
EF9936	Advanced Topics in Public Economics	1
EF9941	Advanced Topics in Development Economics	1
EF9944	Adv Topics in Environmental Economics	1

Group B		**Credits**
EF8913	Empirical Topics in International Finance	1
EF8932	International Trade-Imperfect Comp	1
EF8933	Empirical Topics Int'l Trade	1
EF8935	Law/Reg-Int'l Trade and Invest	1
EF8937	Labour Economics	1
EF8938	Development Microeconomics	1
EF8939	Topics in Econometrics	1
EF8940	Environment Economics	1
EF8942	Industrial Organization	1
EF8943	Monetary Economics	1
EF8944	Panel Data and NL Model Analysis	1
EF8945	Nonparametric Data Analysis	1
AM8001	Analysis and Probability	1
AM8201	Financial Mathematics	1

*Note: Up to 2 credits may be given for coursework at the Master's level.

COURSE LISTING

Master's Paper
The student is required to complete a research paper on a topic selected in consultation with the student's supervisor. On completion, the research results are submitted in research paper format to the supervisor and a second reader, who assess and grade the research paper. Through the research paper, the student is expected to provide evidence of competence in carrying out research and a sound understanding of the material associated with the research. This is a "Milestone". Pass/Fail.

Master's Internship
Students will undertake an internship in the fields of Economics and Finance that allows them to develop links between theoretical knowledge learned in a classroom and a professional/practical setting. One academic term in length, students will be required to submit a detailed report at the end of the internship as well as an employer evaluation. The Department does not guarantee internship for all enrolled students, nor does every placement qualify for credit. Department consent is required to enroll. This is a "Milestone". Pass/Fail

PhD Comprehensive Examination
The comprehensive examinations will consist of two exams in microeconomic theory and macroeconomic theory, and one field exam. The theory exams should be completed successfully within two years of registration into the PhD program. The field exam must be completed in the third year of study. This is a Milestone. Pass/Fail

PhD Dissertation
Preliminary research to develop a dissertation topic normally begins in the second year of study. A dissertation proposal must receive the approval of the Faculty Advisor and members of the Dissertation Supervisory Committee in the third year of study before the end of the Winter term.
To complete the PhD degree, a student's dissertation that contains original and significant research must receive final approval of a Dissertation Examining Committee, as described by the official policies of the SGS. The dissertation must be presented and defended at a public colloquium convened by the Dissertation Supervisor for that purpose. This defence must be announced at least three weeks in advance with copies of the dissertation available for faculty and graduate students at least one week before the defence. This is a Milestone. Pass/Fail

EF8100 Mathematics and Statistics Review
All students admitted into the Graduate Economics - MA program must demonstrate competence in quantitative methods by passing a preliminary course in mathematical economics. Course material will be provided both in class and on the web during the last two weeks of August. Attendance is highly recommended but not compulsory. This is a pass/fail, non-credit course for which there will be an exam before the official start of the Fall term. Students who fail the first attempt must rewrite the exam by October 31st of that year. Non-attendance to the final exam is also counted as a Fail. If the student fails the second attempt or is unable to rewrite the exam by October 31st, the mark from their first attempt (Fail) will be considered their final grade, and they will be asked to withdraw from the program. Non-credit. Pass/Fail

EF8901 Microeconomics
This course provides in depth coverage of the foundations of microeconomic theory required for effective analysis of international economic issues. Fundamentals such as static and dynamic optimization, consumer choice (deterministic and under uncertainty), and producer theory (profit maximization, costs, and duality) will be supplemented with applications to market structure, game theory in trade and policy, the economics of information, and general equilibrium. Examples and illustrations will be drawn from an international context throughout the course. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8902 Macroeconomics
This course is an introduction to graduate macroeconomics and the techniques associated with analyzing macroeconomic models. Topics include theories of aggregate supply, rational expectations, inflation and monetary policy, growth theories, consumption and savings, open economy macroeconomics and empirical methods suitable for studying international linkages of exchange rates, interest rates and prices. The technical tools include standard calculus, linear algebra, optimization in continuous time using the Hamiltonian, optimization in discrete time using dynamic programming, and methods in time series analysis. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8903 Applied Econometrics
This is an introduction to estimation and inference in econometrics, in the context of the linear regression model. Estimation methods include Ordinary Least Squares (OLS), Generalized Least Squares (GLS), Instrumental Variables (IV) and Maximum Likelihood (ML). Inference will be based on test statistics from unrestricted and restricted parameter estimates. Theoretical and applied aspects of the course will be considered. Working knowledge of econometrics software such as R, Matlab, SAS, or STATA is recommended. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8904 Financial Theory
This course is designed to provide graduate students with a broad overview of financial economics. We will cover expected utility theory, risk aversion and investment decisions, and a variety of asset pricing models such as CAPM, Arrow-Debreu pricing theory, arbitrage pricing theory, and consumption CAPM. The course covers quantitative techniques such as optimal portfolio decision-making, Value-at-Risk and the dynamic general equilibrium modelling of financial business cycles. Antirequisite: AM 8201. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8911 International Finance
This course examines theoretical and empirical issues regarding international macroeconomics. Topics include the determinants of the international balance of payments, theories of foreign exchange rate determination, fixed versus flexible exchange rate regimes and the efficacy of monetary and fiscal policies under such regimes. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8913 Empirical Topics in International Finance
The objective of this course is to develop a solid understanding of international financial markets and examine managerial decision making in an international setting. International financial markets will be studies in the context of the foreign exchange, offshore, derivative securities, and international asset portfolio markets. Theoretical and empirical aspects of these markets will be analyzed in

detail. Decision making regarding the measurement and management of risk in international markets will be analyzed from the point of view of individuals and firms. Prerequisite: EF8903 or equivalent, or Departmental permission. 1 Credit

EF8914 Financial Econometrics
This course introduces students to the most frequently used time series models in finance and a variety of econometric techniques that are essential to estimate time series models. Topics include forecasting models such as ARMA and ARIMA processes, volatility models such as ARCH-GARCH processes, and market co-movement models. Multivariate stationary and non-stationary processes will also be examined in the context of Vector Autoregressive (VAR) models and Vector Error Correction Models (VECM) for integrated processes. Real data will be used for empirical applications of these models. Students of this course are expected to have a solid background in econometrics and have working knowledge of a programming package such as Matlab or R. Prerequisite: EF8903 or equivalent, or Departmental permission. 1 Credit

EF8931 Int'l Trade Theory, Policy
This course offers an in-depth treatment of the Classical, neoclassical, and contemporary theories of international trade. Topics include commercial policy, income distribution, international factor movements, and growth. The course also examines various trade policies and their impact on welfare. Prerequisite: EF8901, or Departmental permission. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF8932 Int'l Trade - Imperfect Comp
This course will provide students with a firm grasp of theoretical and empirical methods of analyzing international trade outside of the traditional competitive framework, utilizing the tools of New Trade Theory. Topics addressed include multinational corporations, strategic interaction between governments and firms, intra-industry trade, intellectual property rights and the emergence of international technology gaps. Prerequisite: EF8901, or Departmental permission. 1 Credit

EF8933 Empirical Topics Int'l Trade
This course examines the pattern of trade and the welfare consequences of various trade policies from an empirical view point and teaches the students how to apply trade analysis in a policy environment. The use of the gravity equation will be examined as well as other methods of analyzing trade flows and impediments to trade such as tariffs and transportation costs. The course will emphasize the difficulties in obtaining data and deciding on the appropriate estimation method. Prerequisite: EF8901, or Departmental permission. 1 Credit

EF8934 Global Inst and Int'l Economy
This course is divided into two parts. The first part investigates various explanations of why institutions exist and examines the challenges of creating international institutions that enforce agreed upon rules governing economic relations among nations. The second part of the course looks at the structure of existing international institutions, such as the IMF, the World Bank and the WTO. Case studies will be presented to analyze the impact of policies of these institutions on the national economies. Instructor permission required. Prerequisite: EF8901, or Departmental permission. 1 Credit

EF8935 Law/Reg – Int'l Trade and Invest
This course introduces the student to the law and regulation of international trade and investment. The course will begin with an introduction and overview of the history and characteristics of the WTO trading system. The similarity and differences to USMCA will be reviewed. Students will then examine the regulation of trade in goods and services, as well as current international regulatory issues relating to the environment, labour, immigration, culture and ethics. Government procurement and intellectual property rules will be examined. International investment rules and dispute settlement will be studied as well as international competition policy and its relationship to AD and CVD rules. The course will conclude with an examination of the dispute settlement regimes of USMCA and the WTO. Prerequisite: EF8901, or Departmental permission. 1 Credit

EF8936 International Public Economics
Globalization and the ongoing integration of world markets have serious implications for the nature and impact of domestic fiscal policies. The design of taxation policies in modern economies requires that policymakers carefully consider the international ramifications of their decisions. This course examines some important issues in international taxation. Topics to be covered include the effects of fiscal policy in an open economy relative to a closed economy, optimal income taxation in an open economy, taxes and portfolio choice, tax harmonization and tax coordination, and the impact of taxation on the activities of multinational corporations. Prerequisite: EF8901 or equivalent, EF8902 or equivalent, or Departmental permission. 1 Credit

EF8937 Labour Economics
This course examines theoretical and empirical issues regarding international labour economics. While goods and capital markets across countries are integrating rapidly, labour markets are integrating at a much slower pace, especially between developing and developed countries. Nevertheless labour markets are deeply affected by the integration in the other markets. The relationship between labour markets dynamics and the integration in capital and goods markets will be the focus of the course. Topics to be covered include regional labour market differences, the interaction between international trade, capital flows and labor markets, the importance of human capital formation for development, and international migration. 1 Credit

EF8938 Development Microeconomics
The purpose of this course is to provide a microeconomic analysis to some important issues of the current global economy. The topics we intend to cover are taken from a broad spectrum, ranging from current industry practices (e.g., outsourcing) to institutions in developing countries (e.g., Grameen Bank-a highly successful rural micro-credit program in Bangladesh).1 The approach will be of a theoretical nature, applying tools of general microeconomic theory to some of the major issues of the international economy. Although we shall often provide illustrations using case studies, the emphasis will be on microeconomic analysis rather than descriptive accounts. As the course will discuss the micro-foundations of institutions as well as industry practices that have important trade policy implications, it will complement the existing courses on institutions and trade (e.g., International Trade under Imperfect Competition, Global Institutions and the International Economy). 1 Credit

EF8939 Topics in Econometrics
This topic course introduces different topics in econometrics. Topics will differ depending on the availability of instructors. Topics could include microeconometrics, time series econometrics, nonparametric econometrics, or Bayesian econometrics. Prerequisite: EF8903 or equivalent, or Departmental permission. 1 Credit

EF8940 Environment Economics
An evaluation of the theory and practice of economic sources of environmental problems and environmental policy, including emissions taxes, standards and permits. Analysis of approaches to address topics such as regional air pollution, global climate change, water allocation, and the use of renewable resources, and the relationship between the environment and population growth, income, international trade and economic development. 1 Credit

EF8941 Topics in Dev Economics
A survey of empirical methods in development microeconomics. The course examines different methodologies used to measure the effectiveness of development policies. Topics include analysis of randomized controlled trials, quasi-experimental methods, survey methodology, and poverty measurement. 1 Credit

EF8942 Industrial Organization
Industrial Organization is the formal study of firm behavior under imperfect competition. The objective of this course is to provide a rigorous understanding of certain core theoretical aspects of the behavior of firms and industries in imperfectly competitive markets. The main emphasis of the course will be upon oligopoly theory. The course will cover issues such as oligopoly pricing, price discrimination, location strategies, product differentiation, structure of firms and mergers, entry deterrence, advertising and the economics of research and development. Prerequisite**:** EF8901 or Departmental permission. 1 Credit

EF8943 Monetary Economics
The goal is to study theoretical frameworks that can help us make sense of recent financial market developments and to see what these theories suggest in the way of appropriate interventions in (and following) a financial market crisis. We begin by reviewing the foundations of monetary exchange and the role of banks as suppliers of liquidity. Discussions may also include: role of central banks, the emergence of "shadow banking", and special properties of exchange media. 1 Credit

EF8944 Panel Data and NL Model Analysis
The first part of this course covers panel data models: static panel data models and dynamic panel data models. The second part deals with limited-dependent variable models in the cross-sectional setting such as discrete choice models, censored and truncated regression models and sample selection models. 1 Credit

EF8945 Nonparametric Data Analysis
This course provides an introduction to nonparametric methods used in econometrics. Nonparametric methods are statistical techniques which do not require the researcher to specify a particular form for the function being estimated (e.g., probability density function, regression function, etc.). The primary goal of the course is to enable students to intelligently apply these methods in analyzing real-world economic data. 1 Credit

EF9100: Economics PhD Seminar
Students devote their third and fourth years of study to developing and refining their dissertation research. The objective of the PhD seminar series is to prepare students for writing their PhD dissertations by providing opportunities for PhD candidates to present their research to other students and faculty. Every year, PhD candidates in third year and above must present their ongoing research. Attendance in the PhD seminar course and the regular departmental seminar series are mandatory for all PhD students in second year and above. Pass/Fail

EF9901 Advanced Microeconomics I
The goal of the Advanced Microeconomics I and II sequence is to provide a firm microeconomic foundation, and the necessary toolkit, for advanced doctoral study in economics. We will analyze consumer theory, producer theory, decision theory, game theory, the economics of information, the general equilibrium theory. We will learn how to use these tools correctly when applying economic analysis to the real world. This is the first course of the sequence. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9902 Advanced Macroeconomics I
The objective of this course is to introduce students to modern macroeconomic theory. The course formally analyzes the basic models used in modern macroeconomics theory and their applications to the study of various economic issues. Topics covered include recursive methods, asset pricing, search frictions, and the labour market. Student will learn to use MATLAB software in order to numerically solve some of the models introduced in the course. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9903 Advanced Econometrics I
This is the first half of the PhD-level econometrics sequence. Topics to be covered include ordinary least square estimator, instrumental variable estimator, and estimators accounting for unobserved effects in panel data. Prerequisite: EF9904 or Departmental permission. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9904 Mathematical Economics
The field of economics has become more technical over the years. Macroeconomic models often involve the solution of complex dynamic optimization problems. In microeconomics, the relaxation of the assumptions of perfect information and complete markets requires the use of advanced mathematical tools that are usually not familiar to students entering the field. The objective of this course is to provide the students with the technical tools and concepts that they will use in their graduate economic courses. Topics include: linear algebra, set and measure theory, convex analysis, and optimization and fixed point theory. A significant part of the course is devoted to economic applications that illustrate how the concepts and techniques are used in the different areas of economics. These

applications are designed for the students to recognize the link between mathematical and economic theory. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9905 Advanced Topics in Int'l Trade I
Traditional theories of comparative advantage are generalized to include alternative sources, and higher dimensional issues. Imperfect competition, external economies, alternative preference representations, asymmetric information, offshoring and outsourcing are introduced into international trade models. Analysis of the gains from trade in different frameworks and the effects of trade on income distribution. The role of international trade and tax policy. Analysis of the design and structure of trade agreements and tax treaties. Prerequisite: EF9901 and EF9921, or Departmental permission. 1 Credit

EF9906 Theory and Methods in International Finance
The objective of this course is to examine the theoretical and empirical connections between national asset markets. This course covers topics in open-economy macroeconomics and international finance. Topics may include dynamic stochastic general equilibrium models, small open economy models, international business cycles, international financial markets and capital flows, asset pricing puzzles, risk-sharing puzzles and exchange rate implications of macroeconomic models. Prerequisite: EF9902 and EF9922, or Departmental permission. 1Credit

EF9907 Game Theory
This course offers students a rigorous introduction to game theory, together with some of its applications to various strategic aspects in economics. Important concepts covered in this course include: strategic-form and extensive-form games, refinements of Nash equilibrium, epistemic foundations, repeated games, bargaining, voting, auctions and mechanism design. We also illustrate how these concepts and analytical tools can be useful in understanding strategic behavior in economic, political and social interactions. Prerequisites: EF9901 and EF9921, or Departmental permission. 1 Credit

EF9908 Advanced Topics in Macro and Finance
This course is an introduction to modern asset pricing theories and applications. It examines asset pricing theories from the perspectives of stochastic dynamic macroeconomic models and recent developments in the theory of finance. Topics to be covered include the pricing of stocks, bonds, options, portfolio theory, the term structure of interest rates, real investments and heterogeneous agent models. The empirical aspects of asset pricing theories will be examined using modern financial econometric techniques such as the generalized method of moments (GMM). Prerequisite: EF9902 and EF9922, or Departmental permission. 1 Credit

EF9909 Numerical Methods in Economics
Economic models have become increasingly sophisticated in order to better capture the inherent complexities of real-world behaviour. The majority of these models however cannot be solved analytically using the standard mathematical tools of calculus and algebra. For this reason, economists frequently need to resort to numerical methods. The objective of this course is to introduce students to various computational techniques and their application to economic analysis. Topics to be covered include solution of linear and nonlinear systems of equations, optimization, numerical integration and differentiation, and numerical dynamic programming. The MATLAB software package will be used to illustrate the various techniques and for completing the assignments in the course. Prerequisite: EF9904 Mathematical Economics or Departmental permission. 1 Credit

EF9910 Advanced Topics in Int'l Trade II
A continuation of the topics in EF9905. Prerequisite: EF9901 and EF9921, or Departmental permission. 1 Credit

EF9911 Advanced Topics in Labour Economics
The purpose of this course is to familiarize graduate students with empirical techniques and theoretical ideas which are currently widely used in labour economics. Topics include neoclassical analysis of the labour market and its institutions; a systematic development of the theory of labour supply, labour demand, and human capital theory; theories of wage and employment determination, turnover, search, unemployment, equalizing differences, and union behaviour, with particular emphasis on the interaction of theoretical and empirical modeling. Prerequisite: EF9901, EF9903 and EF9921, or Departmental permission. 1 Credit

EF9912 Directed Studies in Economics
This course is for students who wish to gain knowledge in a specific area for which no graduate level classes are available. Students who are approved to take the course are assigned a suitable class advisor most familiar with the proposed content. Students are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized format. 1 Credit

EF9913 Primer, Mathematical Economics
This course is designed to ensure that PhD students have the mathematical competency necessary for their first-year required courses. The exam will be before the start of the Fall semester. Students who do not pass the exam will be advised to withdraw from the program. A second attempt will be given by the end of October. Non-credit. Pass/Fail.

EF9914 Advanced Topics in Financial Econometrics
This course introduces the econometrics used in empirical finance. The main goal is to provide students with an econometric (statistical) foundation for pursuing research in financial economics. It covers some of the most important models and methods used in the empirical time series analysis. Topics include evaluation of asset pricing theories, models of volatility, models of nonlinear dependence, and models for risk management. Prerequisite: EF9903 or Departmental permission. Antirequisite: EF8914. 1 Credit

EF9921 Advanced Microeconomics II
The goal of the Advanced Microeconomics I and II sequence is to provide a firm microeconomic foundation, and the necessary toolkit, for advanced doctoral study in Economics. We will analyze consumer theory, producer theory, decision theory, game theory, the

economics of information, the general equilibrium theory. We will learn how to use these tools correctly when applying economic analysis to the real world. This is the second course in the sequence. Prerequisite: EF9901 or Departmental permission. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9922 Advanced Macroeconomics II
The objective of this course is to familiarize the students with the analytical techniques of dynamic macroeconomics theory and its application to the study of several macroeconomic issues. Topics covered include dynamic programming for deterministic and stochastic economics, growth theory, monetary and fiscal policy, Bewley models and the determination of wealth and income distributions, and incomplete markets theory. Students will learn numerical techniques and use MATLAB software. Prerequisite: EF9902 or Departmental permission. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9923 Advanced Econometrics II
This course is intending for PhD students in Economics and extends the material covered in EF 8903: Econometrics I. Topics covered include instrumental variable estimation, generalized method of moments, binary response models, panel data models, time series models and quantile regression. Prerequisite: EF9903 or Departmental permission. 3 lecture hours + 1 tutorial hour/week. 1 Credit

EF9936 Advanced Topics in Public Economics
The purpose of this course is to familiarize graduate students with modern empirical techniques and theoretical concepts of public economics, including government revenues and expenditures. Students will learn to critically analyze public programs and fiscal policies. Topics to be covered include tax incidence, efficiency and avoidance, income, corporate and wealth taxation, social insurance and the provision of public goods. Prerequisite: EF9901, EF9921, or Departmental permission. Antirequisite: EF8936. 1 Credit

EF9941 Advanced Topics in Development Economics
This course provides a partial survey of academic research on economic issues facing developing countries. The methodological focus is on applications of econometrics and economic theory and developing intuition about when and how to use these tools, particularly when interpreting and evaluating data relevant for the conduct of public policy. Prerequisite: EF9903 or Departmental permission. Antirequisite: EF8941. 1 Credit

EF9944 Adv Topics in Environmental Economics
This PhD-level course introduces the basics of dynamic optimization in the field of resource economics, and provides an advanced analysis of environmental economic questions in an applied framework. Topics include the economics of renewable and non-renewable resources, sustainability, natural resource management, climate change, and biodiversity. Prerequisites: Successful completion of PhD Comprehensive Exam. Antirequisite: EF8940. 1 Credit.

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ELECTRICAL AND COMPUTER ENGINEERING

CURRICULUM

Professional Master's Diploma

DIPLOMA REQUIREMENTS

	PMDip Energy and Innovation	**Credits**
EE8901	Smart Grids	1
EE8902	Demand Management, Conservation	1
EE8903	Energy Use and Storage	1
EE8904	Electricity Markets	1
EE8905	Diploma Project	Pass/Fail

Master of Applied Science

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		(Milestone)
EE8010	Master's Research Seminar in ELCE	
Five Elective credits from Table A		5

Master of Engineering

DEGREE REQUIREMENTS	**Credits**
Master's Project*	(Milestone)
Eight Elective credits from Table A**	8

*students may apply to substitute 2 courses for the project.

** With the permission of the Program Director, a student may substitute up to 2 courses from Table B

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
EE9010	PhD Research Seminar in ELCE	
Four Elective credits from Table A		4
(Only one elective credit may be a Directed Studies course)		

ELECTIVES

		Credits
TABLE A		
EE8102	Statistical Inference	1
EE8103	Random Processes	1
EE8104	Adaptive Signal Processing	1
EE8105	Digital Signal Processing I	1
EE8107	Digital Communications	1
EE8108	Multimedia Processing & Comm	1
EE8109	Wireless Communications I	1
EE8111	Digital Signal Processing II	1
EE8114	Optical Commun & Networks	1
EE8121	Wireless Networks	1
EE8122	Opto-electronic Devices	1
EE8123	Radio Frequency Circuits Syst.	1
EE8124	5G Wireless Communications and IoT	1
EE8202	Digital Image Processing I	1
EE8204	Neural Networks	1

EE8205	Embedded Computer Systems	1
EE8208	Arch Synth & Des of Dig Sys	1
EE8209	Intelligent Systems	1
EE8212	Digital Image Processing II	1
EE8213	Computer Network Security	1
EE8214	Computer Systems Modelling	1
EE8215	Human Computer Interaction	1
EE8216	Computer Networks	1
EE8217	Reconfigurable Computing Sys	1
EE8218	Parallel Computing	1
EE8219	Arch of Field-Prgr Gate Arrays	1
EE8220	Advanced Digital Filters	1
EE8221	Systems-on-Chip Design	1
EE8222	Advanced Data Engineering	1
EE8223	Deep Learning	1
EE8225	IOT Analytics	1
EE8226	Sustainability Engineering	1
EE8227	Secure Machine Learning	1
EE8228	Neural Information Processing and Retrieval	1
EE8229	Distributed and Cloud Computing	1
EE8301	Linear System Theory	1
EE8401	Computer Methods Pwr Sys Analysis	1
EE8403	Adv Topics in Power Systems	1
EE8405	Power Sys Stability & Control	1
EE8407	Power Converter Systems	1
EE8408	Switched-Mode Power Supplies	1
EE8409	Electromagnetic Theory	1
EE8410	Advanced Power Electronics	1
EE8416	Modeling and Control of Power-Electronic	1
EE8417	Vector Control of Rotating Machines	1
EE8418	Antenna Theory and Design	1
EE8419	Integration of DER	1
EE8420	Microwave Engineering	1
EE8502	CMOS Analog Integrated Circuits	1
EE8503	VLSI Circuits & Sys for Comm	1
EE8504	Adv VLSI/FPGA Sys Design & Opt Alg	1
EE8505	Digital Systems Testing	1
EE8506	Digital CMOS VLSI Integrated Circuits	1
EE8601	Directed St: Electrical Engr	1
EE8603	Sel Topics: Computer Engr I	1
EE8604	Sel Topics: Electrical Engr I	1
EE8605	Sel Topics: Computer Sci I	1
EE8606	Sel Topics: Biomedical Engr I	1
EE8607	Sel Topics: Computer Engr II	1
EE8608	Sel Topics: Electrical Engr II	1
EE8610	Sel Topics: Biomedical Engr II	1

TABLE B

EE8901	Smart Grids	1
EE8902	Demand Management, Conservation	1
EE8903	Energy Use and Storage	1
EE8904	Electricity Markets	1
EE8905	Diploma Project	1

COURSE LISTING

Master's Thesis
The student is required to conduct advanced research on a topic chosen in consultation with the student's thesis supervisor. The supervisory committee, and the thesis supervisor, must also approve the thesis research plan/proposal, which is presented in writing by the student. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the research thesis, and the research results, to this committee. The examination committee will assess and grade the candidate's research thesis. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone."

Master's Project
The Project may consist of an advanced design assignment, laboratory research project, analysis of research data, or an in-depth review of an approved aspect of the scientific literature. The student presents the proposed project plan in writing, which must be approved by the project supervisor, and the supervisory committee. The MEng candidate must submit two copies of the completed project report to the supervisor. An oral presentation of the project report, and results, will be arranged in a seminar format. The supervisor and another member of the supervisory committee will assess and grade the candidate's project report and the presentation. This is a "Milestone."

Candidacy Examination
Candidacy Examination is to ascertain a Ph.D. student's understanding of the basic theories and the recent theoretical and applies developments in his/her area of specialization, and competency to undertake research commensurate with a Ph.D. degree. It must be held within 20 months from the date of initial registration. It will consist of a 3-hour written part and a two-hour oral part, which both must be passed. This is a "Milestone."

Dissertation
The student is required to conduct advanced research on a topic chosen in consultation with the student's supervisor. The supervisor and supervisory committee must approve the research proposal, which is presented in writing and orally by the student. The student must submit the completed research in a dissertation format and make an oral presentation to an examination committee. The examination committee will evaluate the presentation and the dissertation. Through the dissertation, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. The research is expected to result in original and significant contribution to knowledge in the discipline. Pre-requisite: Candidacy Examination. This is a "Milestone."

EE8010 Master's Research Seminar in Electrical and Computer Engineering
This course consists of weekly seminars with emphasis on current research in the specialization fields and emerging areas of electrical and computer engineering. This course will run through Fall and Winter semesters, 1 hour/week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. In order to achieve a pass grade in the course, the student must attend a minimum of 75% of the seminars. Pass/Fail.

EE8102 Statistical Inference
This course is introduction to principles of statistical inference and estimation theory. The subjects cover fundamentals of classical parametric and nonparametric modeling, estimation theory, Hypothesis testing, Maximum Likelihood (ML) estimators, Maximum a posteriori (MAP) estimators, Bayesian estimators, Karhunen Loeve (KL) expansion, Wiener and Kalman filters, as well as selected topics such as graphical models. 1 Credit

EE8103 Random Processes
Probability theory: mathematical model, conditional probabilities, random variables, pdf, transformation of random variables, conditional densities, statistical averages. Random processes concept; ensemble, stationarity, ergodicity, correlation and covariance, power spectral density, calculation and measurement of AVF and PSD, Gaussian random processes, noise. Transmission of random processes through linear systems: time-invariant systems, multiple terminals, Gaussian processes, non-stationary processes. 1 Credit

EE8104 Adaptive Signal Processing
The course begins with a brief review of linear signals and systems. Adaptive filter algorithms such as least mean squares (LMS), recursive least squares (RLS), and recursive least squares lattice (RLSL) will be covered. Linear prediction theory, autoregressive modeling, and spectral estimation will also be discussed. The course will briefly cover advanced adaptive signal analysis techniques based on time-frequency and wavelet transforms. 1 Credit

EE8105 Digital Signal Processing I
The class provides an introductory treatment of the theory and principles of digital signal processing, with suitable supporting work in linear system concepts and digital filter design. More specifically, the class deals with the following topics: general concepts of digital signal processing, continuous-time system analysis, Fourier analysis and sampled-data signals, discrete-time system analysis, discrete-time systems, infinite impulse response digital filter

design, discrete and fast Fourier transforms, and general properties of the discrete Fourier transform. Background in Signals and Systems is required. 1 Credit

EE8107 Digital Communications
The class is intended to introduce the student to the concepts and theory of digital communications. The concepts of information, channel capacity, error probability, intersymbol interference, pulse shaping and spectrum shaping and optimum filtering are discussed. Digital multiplexing and bit stuffing, encoding, scrambling, equalization and synchronization problems are studied. Regenerative repeaters, M-ary signaling systems, basic modulation techniques - ASK, PSK and FSK; and performance characteristics of digital transmission systems are considered. 1 Credit

EE8108 Multimedia Processing and Communications
This course will touch some of the fundamental issues in media processing and applications. It will start with a quick look at the standards which set the baseline work for multimedia, such as MPEG-4 and MPEG-7. It will then present to the class the latest and the most important issues in multimedia, including indexing and retrieval, media coding, media transmission, human-computer interface, image and speech processing for multimedia, wireless multimedia, and more. Examples, demonstrations, and applications will also be provided. 1 Credit

EE8109 Wireless Communications I
This class provides an overview of wireless communications systems and fundamental analysis and design techniques. The class introduces cellular system, channel characterization for propagation losses, fading, and interference. Coding, modulation, and advanced transceiver design issues are examined. Modern mobile wireless communication system applications are reviewed.
1 Credit

EE8111 Digital Signal Processing II
This course covers signal processing topics such as discrete cosine transform, principal component analysis, continuous and discrete wavelet transforms, multirate filterbanks, independent component analysis, and quadratic time-frequency distributions. Applications of the above techniques in denoising, data compression, feature extraction, and source localization will also be discussed. Prerequisite: EE8105 or equivalent. 1 Credit

EE8114 Optical Communications and Networks
The objective of the course is to provide an in-depth understanding of light wave communication systems. Active and passive state of the art photonic devices that form the backbone of high-speed optical systems will be studied. Theoretical and practical aspects of the devices as well as the optical channel will be evaluated. Relevant issues such as analog and digital optical modulation techniques, noise sources and mechanisms, optical signal processing techniques and multiple access techniques such as DWDM (dense wavelength division multiplexing) and CDMA (code division multiple access) will also be covered. Both the guided (fiber based) and free space (optical wireless) systems will be discussed. 1 Credit

EE8121 Wireless Networks
This course is a moderately advanced level course on wireless networks. This course will assume necessary background knowledge in Internet Protocol (IP) networks with particular emphasis on routing, transport protocol design (congestion control and flow control), and quality of service and then build upon it. In particular, this course focuses on four major areas of wireless networks: (1) Design of different WNs including their integration, (2) Medium access control for WN, (3) Routing in WN, and (4) TCP design for WN. A discussion on applications and security is also included to introduce the students with those topics. 1 Credit.

EE8122 Opto-electronic Devices
This course offers a comprehensive overview of optical properties of semiconductors devices. The course begins with the transmission properties of electromagnetic wave in different media. This introduction is followed by the devices that generate light: light-emitting diodes (LEDs) and laser diodes (LDs). Topics also include optical spectra and transitions, spontaneous and stimulated emission, population inversion, carrier and optical confinements in heterostructures, etc. Some of the most popular devices such as LCD, CCD, DVD and LED will be discussed. The last part is the semiconductor photodetectors such as photoconductors, photodiodes and avalanche photodiodes. 1 Credit.

EE8123 Radio Frequency Circuits and Systems
This course deals with the design of CMOS circuits & systems for wireless communications. Key components include introduction of RF transceivers, impedance transformation, noise, low-noise amplifiers, mixers, frequency synthesizers, and power amplifiers. Antirequisite: ELE804 1 Credit

EE8124 5G Wireless Communications and IoT
The class provides an overview of 5G wireless communications systems and Internet of Things (IoT) with fundamental analysis and design techniques. The class introduces 5G cellular system, channel characterization for

propagation, fading, and interference. Advanced 5G modulation and multiple access design issues may be examined. Relevant state-of-the-art communications and lot technologies, such as localization and tracking, may also be introduced. Prerequisite: UG Digital Communications. 1 Credit

EE8202 Digital Image Processing I
This course starts with the introduction to digital image fundamentals, imaging geometry, and image storage formats. Simple spatial domain techniques as well as spatial frequency domain methods and digital filter design for image enhancement and restoration are discussed. Low-level image segmentation and feature extraction concepts will also be introduced. Special topics in application of image processing including remote sensing, medical imaging, etc. will be presented. 1 Credit

EE8204 Neural Networks
The class deals with preliminaries of artificial neural systems including fundamental concepts and models. Single layer perception classifiers and multi-layer feed forward networks, single-layer feedback networks, and associative memories are covered. 1 Credit

EE8205 Embedded Computer Systems
This course focuses on the design and implementation of software for embedded systems. High performance embedded system and safety critical embedded system architecture will be introduced, Fault-tolerant and reliable embedded system design techniques are also highlighted. The main topics to be covered include embedded computer organization, hardware/software codesign of embedded systems, CAD tools for hardware/software codesign, system on chip, advance concepts of real-time operating systems and real-time scheduling. The course introduces the technologies used in the design of embedded systems such as processor cores, embedded system specification languages, and software tools for hardware/software co-verification and system partitioning. The application of embedded systems for emerging networking and medical devices will also be covered. 1 Credit

EE8208 Architectural Synthesis & Design of Digital Systems
This course will explore the methodologies for high-level architectural synthesis and low-level logic design of digital systems and architecture-to-task optimization techniques. Topics will include: architecture overview of modern computing systems, overview of recent hardware basis for custom digital systems (FPGA and CPLD) and hardware description languages (VHDL), methodology for high-level architectural synthesis including resource scheduling and binding, and low-level logic synthesis of digital systems. Case studies on synthesis process of digital systems from functional and technical specification to electrical schematic diagram will be discussed. Students are expected to read selected papers from current research literature, learn one of hardware description languages (VHDL or Verilog) and perform a project using a commercial CAD system. 1 Credit

EE8209 Intelligent Systems
This course introduces the fundamental practice and underlying principles involved in the study of intelligent systems. The emphasis of the course is on a practical approach to problem solving and learning processes in the context of neural networks. In addition to theoretical, mathematical, and implementation of such systems students will get exposure to some of the popular intelligent systems tools. Applications in signal processing, pattern recognition and vision will be considered. Antirequisite: ELE888 1 Credit

EE8212 Digital Image Processing II
This course deals with advanced concepts in digital image processing. In particular, emphasis will be on color image processing. The concepts that will be covered include: color vision, trichromacy theory, color spaces, colour image creation/representation/storage, component colour image processing, vector colour image processing, segmentation, and colour image compression. The course will include a practical aspect by discussing applications and implementations of image processing techniques currently in use in industry. The course will have student implemented assignments and projects that will require hands-on programming, literature reviews and oral presentation. Prerequisite: EE8202 or equivalent 1 Credit

EE8213 Computer Network Security
This course provides a thorough understanding of technologies and methodologies in network security. It deals with the fundamental techniques used in implementing secure network communications, and forms of attacks on computer networks and approaches to their prevention and detection. Topics that are covered include Introduction to Cryptography, Virtual Private Networks (VPN), Firewalls and intrusion detection techniques. In addition, the course covers worms, viruses, and DDOS attacks and their remedies. Kerberos authentication Protocol, SSL, and anonymous communication protocols. 1 Credit

EE8214 Computer Systems Modeling
The objectives of this course are to study the characteristics of various analytical models of computer systems and to learn how to apply those models to analyze system performance and dependability. The modeling techniques to be covered include Poisson, renewal, Markov processes, fault trees, Petri nets and queuing networks. Examples include models of computer systems, computer networks, and wireless systems. 1 Credit

EE8215 Human Computer Interaction
The course is designed as an introduction to Human Computer Interaction from the perspective of human capabilities and limitations. It will provide the student with an understanding of human sensory systems and information processing models to support future work in any systems design where there is a human interface. Applications range from basic computer interfaces and web page design to semi-autonomous robotics and remote systems control to the design of complex systems such as flight simulators or other virtual environments. By the end of the course, the student will have gained knowledge in some of the essentials of cognitive human factors and information theory concepts, and an understanding of factors that affect human performance such as memory, learning, attention and reaction times. The student will be capable of specifying displays and controls to optimize overall useability and system performance outcomes. Prerequisite: CMN432, BME506, BME705, BLG601 or equiv. Antirequisite: BME802 1 Credit

EE8216 Computer Networks
This is an advanced course in computer networking. The course is designed to include materials relevant to the industry, for example IP QoS and TE necessary for VOIP and MPLS services. The course deals with the principles, architectures, algorithms, and protocols related to Internet, with emphasis on routing, transport protocol design, flow control and congestion control, IP Quality of Service and Traffic Engineering. It also introduces IP security. Anti-requisite: COE865 or ELE865. 1 Credit

EE8217 Reconfigurable Computing Systems
This course will introduce the theory and engineering design principles of the modern reconfigurable computing systems (RCS). The emphasis is on the understanding of the concepts of architecture reconfigurability, programmable logic devices and optimization of the RCS architecture to the task algorithm and data structure. It will also cover basics of the complex programmable logic devices, and FPGA organization and RCS architectures based on these devices. The survey of RCS and areas of their application will also be provided. Languages and compilers for the RSC are other aspects to be covered in this course. Course gives brief description of RCS application in DSP, video and image processing, and supercomputing. Then the specifics of RCS design will be discussed including DSP and embedded processor design flow, modular and incremental design. Synthesis, simulation and verification design tools also will be discussed in details. 1 Credit

EE8218 Parallel Computing
This course will introduce students to parallel computing including parallel algorithms, parallel programming and different parallel architectures. It covers the basic programming models used in parallel computers, parallel algorithms, parallel programming, the shared memory multiprocessor and NUMA multiprocessor. The Laboratory projects include parallel programming using one of the parallel models. 1 Credit

EE8219 Arch of Field-Programmable Gate Arrays
This course will cover the following: Modelling and Evaluation of FPGA Architectures, High-Level CAD Algorithms used in FPGA Architectural Evaluation – Synthesis, Technology Mapping and Packing Tools, Physical-Level CAD Algorithms used in FPGA Architectural Evaluation – Placement and Routing Tools, Architecture and Computer-Aided Design (CAD) Tools for Commercial FPGAs, Power Modelling and Power-Aware CAD Tools for FPGAs, Low Power FPGA Architectures and Circuit-Level Design Techniques, Dynamically Reconfigurable Architectures. 1 Credit.

EE8220 Advanced Digital Filters
This course will enable graduate students to pursue research in digital filters in one and more dimensions, which are applied to such diverse fields as radar, sonar, telecommunications, biomedicine and image/video processing. The students will be encouraged to develop designs and introduce their filters to novel applications. 1 Credit

EE8221 Systems-on-Chip Design
This course covers the advances in system-on-chip (SoC) design, hardware-software co-synthesis and network-on-chip techn ologies. It provides the advance knowledge required for design and development of embedded system on a chip and multi-core architectures. The main principles of embedded system modeling and design will be explored. Various soft processors (Nios-11, ARM) and other IP cores will be studied and SoC design tools (Quartus II, SOPC builder) will be employed in course projects. Antirequisite: COE838 1 Credit

EE8222 Advanced Data Engineering
The objective of this course is to familiarize students with how big data can be stored, maintained and distributed in an effective and efficient way. The course will cover noSQL, MapReduce, SQL on Hadoop, Spark, stream processing systems and main memory data processing techniques. This course will also briefly touch on topics such as semi-structured data, semantic relations, resource description framework, querying semantic information, ontologies, reasoning and the linked open data. 1 Credit

EE8223 Deep Learning
A course on the theory, design, and implementation of neural networks and deep learning. The topics include multilayer neural networks, back propagation algorithm, deep learning in Convolutional neural networks, recurrent

neural networks, and LSTM. 0ther state-of-the-art deep learning/AI algorithms and their applications may also be introduced. 1 Credit

EE8225 IOT Analytics
Internet of Things (IoT) analytics extracts important information from the vast amount of data generated by sensors and smart devices. This IoT Analytics course targets the unmet demand for these skills in every industry vertical. This course is designed to give students an overview of IoT data, state of the practice in IoT analytics, and analytics life-cycle as an end-to-end process. This course presents concepts related to data science research activities including IoT Data Management, IoT Data Modeling, Regression Models, Deep Learning, Social Data Analysis, Anomaly Detection, Machine Learning, Text Analysis. 1 Credit

EE8226 Sustainability Engineering
The course will cover the background on environmental issues, and will emphasize the impact and relevance of the student's field of research on these issues. Topics include the role of emerging technologies in improving environmental outcomes. Applications include energy, electronics, infrastructure, logistics, sourcing, waste, and resource management. Industry standards and best practices will be introduced including economic and social issues and effects. Materials and resource life cycles will be covered in a global context. The course content will be supported by a design and problem solving assignment, as well as a course project. 1 Credit

EE8227 Secure Machine Learning
This course focuses on the theories and techniques of enhancing the security and robustness of machine learning algorithms. Machine learning algorithms are increasingly used in safety critical environments such as self-driving cars and diagnostic imaging. Modern machine learning and deep learning models are shown to be vulnerable to a slight perturbation of input queries or training datasets. A number of machine learning algorithms can also expose private information about individuals. Disclosure of sensitive data not only leads to privacy breaches, but also could result in discrimination or issues of fairness. This course is designed to fill this gap and specifically covers the following topics: privacy preserving statistics and machine learning; adversarial machine learning; certified robustness; poisoning attacks and countermeasures; accountability, transparency and interpretability in machine learning, federated learning to support privacy; and considerations for trustworthy machine learning. The course is open to interested engineering graduate students with a solid undergraduate-level mathematical background. Undergraduate level knowledge of probability, statistics, algorithms and data structures, and machine learning is assumed. Familiarity with information security and deep learning would be helpful but not necessary. 1 Credit

EE8228 Neural Information Processing and Retrieval
This course introduces students to the cutting-edge advances in deep learning and neural networks for Information Retrieval (IR) and Information Processing (IP). Applications of IR and IP include Web search, Web advertising, machine translation, automatic question answering systems, and text summarization. This course provides students with basic knowledge to comprehend the state-of-the-art IR and IP methods based on deep learning and learn the necessary skills to design and implement their own models for IR and IP tasks. Prerequisite: UG course (e.g. ELE 888), OR a graduate course (e.g. EE8204, EE 8603, EE 8209). 1 Credit

EE8229 Distributed and Cloud Computing
This course covers topics related to distributed computing and cloud systems. It presents distributed system architectures; client-server and peer to peer system design; Threading and multi-process computing models; concurrency, synchronization, and inter-process communication; replication, consistency, fault tolerance and recovery. Client-server application design for web application and its full stack implementation are discussed. Web application development using Python framework on a public cloud is covered. Cloud service models; virtualization using VM and containers; their orchestration and performance issues are discussed. Case studies on public and private clouds are presented. Recent developments of multi-cloud and edge clouds are introduced. It includes a major project on the development of distributed software using Python framework and its deployment on a public cloud. Prerequisite: EE8216. Antirequisite: COE892. 1 Credit

EE8230 Machine Learning for Engineers
This course will provide an engineering-focused introduction to key concepts in machine learning. Theoretical concepts such as supervised, unsupervised learning, k-nearest neighbors, random forests, convolutional neural networks, attention mechanism will be introduced. Practical applications of such concepts will be taught through implementation in Python, Pandas, Numpy, SciPy, and PyTorch. Students will also get an in-depth analysis on ethical issues in machine learning and how they affect engineering (limitations of training data, fairness and error functions). **This course is designed to be offered to non-electrical and computer engineering graduate students only**.

EE8301 Linear System Theory

The main thrust of the class is to introduce an algebraic unification of finite-dimensional linear systems with emphasis on continuous and discrete dynamic systems, using an operator theoretic approach. Topics covered include transition matrices, functions of matrices, adjoint systems, weighing patterns, realizability; canonical forms; stability, minimal realization; minimum norm, and approximation problems. 1 Credit

EE8401 Computer Methods in Power System Analysis
Advanced topics in load flow analysis; Decoupled load flow, inclusion of high-voltage direct current links in load flow. Parameter estimation for power systems. Static state estimation. Load modeling. 1 Credit

EE8403 Advanced Topics in Power Systems
Basic concepts. Review of optimization techniques. Linear and non-linear programming. Pontryagin's maximum principle. Fletcher-Powell method, etc. Systems security monitoring. State estimation. Optimal power flow. Real and reactive power optimization. On-line optimization. Load dispatching. Generator scheduling, maintenance scheduling in hydro, thermal and hydrothermal systems. Some case studies. 1 Credit

EE8405 Power System Stability and Control
This is an advanced course in power system stability studies focused on the design of digital signal processing systems for improvement of steady state and transient power system stabilities. This course provides studies on analytical techniques and computer methods for power system stability enhancement, and digital signal processing control design and implementation of advanced power system stabilizers. 1 Credit

EE8407 Power Converter Systems
Principle of ac to dc converters, dc/dc and dc/ac converters, voltage and current source converters, multi-level high-power converters, pulse width modulation techniques, harmonic reduction techniques, modeling and simulation techniques, and industrial applications. 1 Credit

EE8408 Switched-Mode Power Supplies
A course on switched-mode power supplies. Major topics include: switched-mode power supply topologies, soft-switched and resonant converters, power factor correction circuits, analysis of steady-state operation, modelling and control of switch mode power supplies, control design and stability analysis, magnetic design. 1 Credit

EE8409 Electromagnetic Theory
The course will cover the following: Electromagnetostatic fields, Maxwell's equations in the time domain, and in the frequency domain using Fourier integral transform, Poynting and uniqueness theorems, losses due to polarization damping forces, Helmholtz wave equation, auxiliary potential functions, reciprocity theorem. Transverse electromagnetic waves, wave polarization, reflection and transmission at interfaces, wave-transmission matrices, oblique incidence, electromagnetic radiation from fast transients, lightning-generated electromagnetic pulse. 1 Credit

EE8410 Advanced Power Electronics
A course on solid-state electronic power converters and their applications. Major topics include solid-state switching devices, non-isolated and isolated converter topologies, and dynamic modelling and control of converters, and magnetic design. 1 Credit

EE8416 Modeling and Control of Power-Electronic
This course will enable graduate students to pursue research in the area of design, modelling and analysis of static, electronic, power converters. Even though the presented methodologies are rather general and thus applicable to various types of power-electronic converters, the emphasis will be on the three-phase Voltage-Sources Converter (VSC) technology, which is widely employed in such systems as Distributed Energy Resource (DER) systems; active distribution systems and micro grids; photovoltaic (PV), and fuel-cell energy systems; Flexible AC Transmissions Systems (FACTS) ; and High Voltage DC (HVDC) transmissions. 1 Credit

EE8417 Vector Control of Rotating Machines
This course will enable graduate students to pursue research in the area of advanced control of rotating electric machines. The applications include regenerative industrial drives, rotating-machine-based distributed generation and energy storage systems, high-performance position-control machines, and transportation systems. The course will teach methodologies for design, parameter selection, and signal-processing and estimation techniques pertaining to advance control of rotating electric machines. 1 Credit

EE8418 Antenna Theory and Design
The course introduces the fundamental principles of Analysis and design of antennas. This course develops an interest for research in the area of antennas for mobile wireless and advanced communications systems. Particular topics covered are: fundamental parameters of antennas such as radiation patterns, directivity, gain, near field and

far field zones, Detailed Analysis of traditional antennas such as linear wire antennas, loops, arrays and aperture antennas. 1 Credit

EE8419 Integration of DER
Distributed Energy Resources (DERs), such as wind, photovoltaic, and battery energy systems, are rapidly increasing in power systems. This course discusses their impacts on the power system stability and protection. It is designed to cover DER modeling and control, DERs fault ride through, microgrid control, stability, and protection, and cyber-physical security of smart grids. This course will enable graduate students to pursue research on smart grid stability. 1 Credit

EE8420 Microwave Engineering
Introduction to microwave technology, transmission line theory and applications, standing waves and voltage standing wave ratio (VSWR), examples of practical transmission lines, the Smith chart, power flow, transmission-line impedance matching networks, L-section lumped-element matching networks, Z, Y, S and ABCD parameters, passive microwave devices: power dividers and directional couplers, introduction to Computer Aided Design (CAD) techniques, theory and design of microwave amplifiers: FETs, BJTs, 2-port power gains, amplifier stability, design for maximum gain, specified gain, and minimum noise figure. Prerequisite: ELE 531. Antirequisite: ELE861. 1 Credit.

EE8502 CMOS Analog Integrated Circuits
The course deals with fundamental concepts in the design of analog CMOS circuits. Key topics include MOS device physics, I characteristics, regions of operation, small-signal model, single-transistor amplifiers, cascodes, differential voltage amplifier, frequency response of amplifiers, noise, feedback, CMOS op amps, systematic design of op amps, bandgap references, biasing circuits, voltage regulators, filter implementation in CMOS. Antirequisite ELE727. 1 Credit

EE8503 VLSI Circuits and Systems for Communications
This advanced graduate course deals with the design of VLSI circuits and systems for communications. Major topics include fundamentals of data communications (modeling of MOS devices, noise figure, PCM, PAM, inter-symbol interference, modeling of channels, transmission lines and impedance matching, pre-emphasis and post-equalization), wideband amplifier design techniques (low-noise design, gain-boosting, bandwidth enhancement, switching noise, mismatch compensation, voltage-mode and current-mode), high-speed electrical signaling schemes, Gbps serialization and de-serialization, voltage and current-controlled oscillators, phase noise of oscillators, phase-locked loops, clock and data recovery. Prerequisites: EE8501 or EE8502 or equivalent Antirequisite: ELE863 1 Credit

EE8504 Adv VLSI/FPGA Sys Design & Opt Alg
The objective of this course is to introduce the fundamental principles of VLSI (Very Large Scale Integrated) circuit design and layout. This course is targeted towards an introduction to the mathematical topics of “algorithmic graph theory”, and will be followed by introductions to “computational complexity” and “general methods for Combinatorial optimization” for layout partitioning, floorplanning, placement, routing and compaction based on exact mathematical programming (linear, integer and nonlinear programming) as well as an introduction to advanced heuristic techniques (i.e. Tabu search, genetic algorithms and simulated annealing, neural networks, etc.). 1 Credit

EE8505 Digital Systems Testing
The course covers theory and techniques for digital systems testing and testable design. The concepts of fault modeling, fault simulation, test generation, bridging faults testing, functional testing, and logic-level diagnosis are examined. RAM testing, PLA testing, FPGA and microprocessor testing, and design for testability issues are discussed. Compression techniques, built-in self-test and self-checking circuits are considered. 1 Credit

EE8506 Digital CMOS VLSI Integrated Circuits
This course will provide students with various topics in the design and analysis of digital CMOS VLSI integrated circuits. Some of these topics will be discussed deeply and other moderately. The major topics to be covered are: (1) System-level and intellectual property block design methodologies, (2) MOSFET (Metal Oxide Semiconductor Field Effect Transistor) modeling and analysis, (3) Logic families such as complementary CMOS, ratioed CMOS, and dynamic CMOS, (4) Circuit characterization and performance estimation, (5) Interconnects analysis and modeling, (6) Sequential circuits design, and (7) Subsystems design and analysis. Antirequisite: ELE734 1 Credit

EE8507 CMOS Mixed-Signal Circuits and Systems
This course deals with CMOS mixed-mode circuits and systems. Key topics include delay-locked loops and phase-locked loops, analog-to-digital converters (flash, pipelined, and successive approximation, and delta-sigma), time-to-digital converters, all-digital phase-locked loops, simultaneous switching noise and analog/digital grounding. Antirequisite: ELE827. 1 Credit

EE8601 Directed Studies in Electrical Engineering

This class is available to graduate students in electrical engineering, who wish to gain knowledge in a specific area for which no graduate-level classes are offered. Students are assigned an advisor and are required to present a formal report, or take a formal examination, at the end of the class. 1 Credit

EE8603 Selected Topics in Computer Engineering I
This course consists of lectures, seminars, and readings covering the latest advances and research in Computer Engineering such as communications, signal processing, and computer hardware and software. The course description will be announced prior to scheduling of the course. 1 Credit

EE8604 Selected Topics in Electrical Engineering I
This course consists of lectures, seminars, and readings covering the latest advances and research in electrical Engineering such as electronics, electromagnetics, controls and power devices. The course description will be announced prior to scheduling of the course. 1 Credit

EE8605 Selected Topics in Computer Science I
This course consists of lectures, seminars, and readings covering the latest advances and research in Computer Science. The course description will be announced prior to scheduling of the course. 1 Credit

EE8606 Selected Topics in Biomedical Engineering I
This course consists of lectures, seminars, and readings covering the latest advances and research in Biomedical Engineering. The course description will be announced prior to scheduling of the course. 1 Credit

EE8607 Selected Topics in Computer Engineering II
This course consists of lectures, seminars, and readings covering the latest advances and research in Computer Engineering. The course description will be announced prior to scheduling of the course. 1 Credit

EE8608 Selected Topics in Electrical Engineering II
This course consists of lectures, seminars, and readings covering the latest advances and research in Electrical Engineering . The course description will be announced prior to scheduling of the course. 1 Credit

EE8610 Selected Topics in Biomedical Engineering II
This course consists of lectures, seminars, and readings covering the latest advances and research in Biomedical Engineering. The course description will be announced prior to scheduling of the course. 1 Credit

EE8901 Smart Grids
This course introduces the concept or promise of smart grids. 1 Credit

EE8902 Demand Management and Conservation
This course shall describe various methods for peak demand reduction and conserving energy. 1 Credit

EE8903 Energy Storage and Use
This course shall survey and describe new and promising technologies for energy storage. 1 Credit

EE8904 Electricity Markets
Energy business is driven by economics and this course shall discuss various forms of electric energy and their economic characteristics for electricity sector. 1 Credit

EE8905 Diploma Project
The project will focus on comprehension of new technologies and energy innovation in the context of economics, enabling diploma students to make informed decisions in their workplace. 1 Credit

EE9010 PhD Research Seminar in Electrical and Computer Engineering
This course consists of weekly seminars with emphasis on current research in the specialization fields and emerging areas of electrical and computer engineering. This course will run through Fall and Winter semesters, 1 hour/week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. In order to achieve a pass grade in the course, the student must attend a minimum of 75% of the seminars. Pass/Fail.

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ENVIRONMENTAL APPLIED SCIENCE AND MANAGEMENT

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS		**Credits**
ES8901	Chem and Biological Pathways	1
ES8930	Seminar: Env App Sci and Mgmt	1
AND one of the following two courses**:**		
ES8920	Environmental Policy and Mgmt	1
ES8921	Environmental Law	1
AND one of the following Options:		

PROFESSIONAL PROJECT Option

Master's Project	(Milestone)
Seven Elective credits, with a minimum of two from Group A and two from Group B, and remaining courses from either Group A, B, or C	7

THESIS Option

Master's Thesis	(Milestone)
Four Elective credits, with a minimum of one from Group A and one from Group B, and remaining courses from either Group A, B, or C	4

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
Doctoral Research Symposium		(Milestone)
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
ES9001	Adv Studies in Env Policy Mgmt	1
ES9002	Research Methods: Env App Sc and Mgt	1
AND One Course from each of Group A and Group B		2

ELECTIVES

Group A: Environmental Applied Science		**Credits**
ES8901	Chem and Biological Pathways	1
ES8903	Pollution Prevention	1
ES8904	Waste Management	1
ES8906	Surface Water Pollution Analysis	1
ES8907	Wastewater Engineering	1
ES8908	Soil Remediation	1
ES8909	Environmental Biotechnology	1
ES8910	Energy and the Environment	1
ES8911	Ecotoxicology	1
ES8912	Applied Ecology	1
ES8913	Special Topics: Env App Science	1
ES8914	Principles of Hydrology	1
MS8117	Molecular Ecology	1

Group B: Environmental Management		**Credits**
ES8801	Facl Siting and Env Risk Asses	1
ES8920	Environmental Policy and Mgt	1
ES8921	Environmental Law	1
ES8922	GIS for Environmental Mgmt	1
ES8923	Environmental Assessment	1

ES8926	Environmental Economics	1
ES8927	Risk Assessment in Envi Mgmt	1
ES8928	Special Topics: Env Management	1
ES8929	Responding to Climate Change	1
ES8931	Mgnt. Fundamen. for Envir. Professionals	1
ES8932	Sustainable Transportation	1
SA8921	Spatial Analysis of Land Resources	1
SA8922	Remote Sensing and Spatial Analysis	1
SA8923	Land/Geographic Information Systems	1

Group C: Environmental Applied Science and Management		**Credits**
ES8950	Indepdt Study Env Sci Mgmt, Masters	1
ES8951	Interntl Env Field Research	1
ES8953	Climate Change and Food Systems	1
ES8954	Power & Equity in Env. Practice	1
ES8955	Environmental Forensics	1
ES8956	Sustainable Product Design	1
ES8957	Anti-colonial research methodologies	1
ES9950	Independent Study Enviro Sci Mgmt, PhD	1
SS8000	Stat. Analysis in Social Sci. Research	1
SS8001	Adv. Qualitative Methods	1

COURSE LISTING

Master's Project
The project option is intended for students following a non-academic career path in environmental sustainability, and is typically more applied in nature. In the project option, students propose and carry out work in either a private or public sector organization or as part of their own start-up. The project is under the mentorship of a faculty supervisor. The project is submitted as a technical report or white paper to the faculty supervisor and is evaluated by a project examining committee. This is a "Milestone". Pass/Fail

Master's Thesis
In the thesis option, students conduct advanced research in the area of environmental sustainability (broadly defined). Students propose and carry out the research under the direction of a faculty supervisor and a thesis supervisory committee. On completion, the research is submitted in a thesis format, to the supervisor and defended by the student before a thesis examining committee. Pass/Fail

Doctoral Research Symposium
This is a mandatory requirement for all PhD students. The milestone consists of the organization, by the cohort of PhD students, of a one-day symposium normally held in the Winter semester. The symposium will focus on a current interest in the areas of environmental applied science, policy and management. This is a "Milestone." Pass/Fail.

Candidacy Examination
This is a "Milestone". Pass/Fail

Dissertation
The student is required to conduct advanced research on a topic related to one (or more) of the following specialty areas: environmental applied science, policy and management. The topic is chosen in consultation with the student's supervisor, the student presents the research plan in writing, and the research is carried out under the direction of the supervisor and monitored by a supervisory committee. The student must submit the completed research in dissertation format to Program and School of Graduate Studies examination committees and make oral presentations to these committees, which will make an assessment. Through the dissertation, the student is expected to furnish evidence of competence in research and a sound understanding of the chosen specialty area(s). The research must lead to an original contribution of knowledge in the specialty area(s).
Pre-requisite: successful completion of the candidacy examination. This is a "Milestone." Pass/Fail

ES8801 Facility Siting & Env. Risk Assessment
This course explores the theory and practice of public facility siting and the role that risk analysis and risk assessment play in the siting process. The course will examine the nature of facility siting conflicts, the effects of objective and perceived risks, the methods used in risk analysis and assessment, and the means presently employed in environmental management practice to analyze and manage risks that are the unavoidable consequences of many large-scale public undertakings. Antirequisite: PLE815. 1 Credit

ES8901 Chem and Biological Pathways
This course is devoted to the examination of fundamental and applied aspects in chemical and bio-geochemical processes in the environment. It will primarily deal with the mechanisms which affect the dispersion of naturally occurring and xenobiotic compounds in soils and water. The use of such information and its incorporation into environmental models will be covered. The effect of environmental impacts on chemical and biological processes will be emphasized. The course will include a combination of lectures, student-led seminars and case studies, and a computer-modeling workshop/laboratory. (Platform Course) 1 Credit

ES8903 Pollution Prevention
The course examines a number of industry-environment interactions. It discusses pollution prevention and industrial ecology, and it presents a survey of environmental concerns including material and energy budgets, life-cycle assessment, and industrial process wastes and their minimization. Design for environmental quality is discussed including energy use and design for energy efficiency. The course explores the future of industrial activity with regard to the environment and it reviews studies in selected industrial applications. (Platform Course) Antirequisite: ME8149. 1 Credit

ES8904 Waste Management
This course describes the development of solid waste management in response to legislative requirements for waste transport and disposal. To know when solid waste is a resource or a disposal problem requires its analysis and classification. Processing and handling of solid waste demands the proper application of available technology and basic engineering principles. These will be explained and followed by more advanced principles related to separation (including recycling), processing, and transformation of solid waste. Hazardous waste and hazardous materials, as well as federal and provincial regulatory processes governing hazardous wastes, will also be examined. Waste stabilization and solidification, land disposal of waste, environmental site and subsurface characterization will be discussed. Physical conversion of waste including incineration technologies, chemical and biological conversion technologies as well as successful combinations of the three will be described. The course will conclude with a brief review of the main issues in integrated solid waste management. (Platform Course) Antirequisite: CV8207. 1 Credit

ES8906 Surface Water Pollution Analysis
A quantitative analysis of surface and subsurface water pollution pathways is crucial to the development of water pollution prevention and control plans. This course discusses the point and non-point pollution sources in urbanized areas with emphasis on modeling approaches and analysis techniques. It examines the surface pollution processes. Topics include: surface hydrology, municipal water use cycle, urban drainage systems, point and non-point pollution sources and pollution control and treatment strategies for sanitary, storm, combined sewer systems. Antirequisite: CV8202 1 Credit

ES8907 Wastewater Engineering
The course is an advanced description of the unit operations in wastewater engineering. It includes physical, chemical and biological processes. In the first case, filtration, sedimentation and clarification of solids will be discussed. Liquid-liquid and gas-liquid separations will follow. Chemical operations will include neutralization, precipitation, chemical redox and ion exchange. The last part of the course will cover fixed and suspended growth biological processes. 1 Credit

ES8908 Soil Remediation
This course overviews the design and operation of processes for soil remediation. Contaminants of interest include halogenated and non-halogenated volatiles, halogenated and non-halogenated semi-volatiles, fuel hydrocarbons, pesticides and inorganics. Seven groups of technologies will be examined: (1) excavation and off-site disposal, (2) soil venting, (3) bioremediation, (4) thermal technologies, (5) chemical technologies, (6) mechanical flushing and washing, and (7) natural attenuation. Antirequisite CV8204. 1 Credit

ES8909 Environmental Biotechnology
This course, as a series of lectures and student-led discussions, covers the application of biologically-based technologies in bioenergy and bio-remediation. Areas of application covered include biologically-based remediation of air, soil, solid waste, wastewater, bio-energy, and biofuels. The relevant technologies are discussed along with the potential positive and negative impacts which may be associated with the use of biotechnologies in the environment. 1 Credit

ES8910 Energy and the Environment
A review of thermodynamic fundamentals is provided including combustion, electricity generation, co-generation, heating, cooling and incineration. Energy utilizing technologies in the residential, commercial, institutional, industrial and transportation sectors and their impacts on the environment are examined. Methods and technologies for controlling and reducing the environmental impacts of energy technologies are discussed. The course covers the design of energy technologies for environmental management. (Platform Course) 1 Credit

ES8911 Ecotoxicology
The course examines the fate and transport of the major inorganic and organic contaminants in the biosphere. Their properties, release, environmental destiny, and impact on ecological systems will be studied. Included will be the molecular basis of pollutant toxicity, progressing to consequent effects at higher levels of organization including cellular, whole organism, population, community, and ecosystem. From lower levels of ecological structure to global effects, including geopolitical ramifications, it provides perspectives on this multidisciplinary science. 1 Credit

ES8912 Applied Ecology
This course will address fundamental principles and approaches in ecology and illustrate how they are applied to current environmental problems. We will cover topics such as application of regression analysis in natural resource management; landscape ecology and global change; fisheries management; multivariate descriptive techniques (ordination); and ecological processes structuring biological communities in space and time. Emphasis will be placed on application of ecological theory in practice, and on addressing current natural resource management concerns. 1 Credit

ES8913 Special Topics: Env Applied Science
This course provides the opportunity for the program occasionally to offer a course in response to special non-recurring circumstances. The content will relate to specific topical areas related to environmental applied science that are not covered by existing courses. The particular timing, theme, and structure of the course will vary. 1 Credit

ES8914 Principles of Hydrology
Hydrology is the science dealing with water on Earth. It considers the distribution and circulation of water, its physical and chemical properties, and its interaction with ecological and human systems. This course will cover the principles of how water moves between the atmosphere, Earth's surface and subsurface, its role in the transport of chemicals and materials, its interactions with ecological systems, and the impacts of unsustainable human behaviours on water quantity and quality. 1 Credit

ES8920 Environmental Policy and Mgmt
This course focuses on existing notions of policy formation by drawing on a range of policy theories and environmental policy case studies. It examines the relationship between public policymaking and environmental issues, and reviews major themes such as risk, complexity, evidence, expertise, technology, and institutions. This course is interdisciplinary in nature and examines a range of environmental policy studies that help to explain how environmental awareness and scientific evidence affect the policy process. 1 Credit [restricted to Masters level students]

ES8921 Environmental Law
The field of environmental law in Canada continues to have a dramatic evolution. This course covers major topics of environmental law, including constitutional division of powers, relevance of administrative law, endurance of common law and importance of civil litigation, as well as the role of science in standard setting for regulatory law. Course materials emphasize the substantial contrasts between: common law, criminal law and regulatory law approaches to environmental issues, covering many significant Canadian cases. 1 Credit

ES8922 GIS for Environmental Mgmt
Geographic Information Systems (GIS) are used to examine the spatial dimensions of environmental data and provide capabilities for data analysis in managing environmental problems. GIS systems are being increasingly recognized for their environmental modeling capabilities. This course indicates the uses of GIS in support of site evaluations, effects monitoring, policy development and decision making. Environmental management research opportunities are explored through lectures, case studies, seminars and hands-on activities using major GIS software packages. 1 Credit

ES8923 Environmental Assessment
This course provides an integrated, interdisciplinary approach to the application and evaluation of current biophysical, social and economic impact assessment. It examines environmental assessment as an environmental decision making instrument in provincial, federal and international contexts and it reviews methods to predict, evaluate and mitigate impacts in both human and natural environments. The course reviews the technical and scientific concepts that must be addressed in a comprehensive assessment of project impacts on complex, interacting physical and human systems. This is complemented by a critical appraisal of institutional structure and decision making in environmental management. Evaluation methods and practical applications are emphasized. 1 Credit

ES8926 Environmental Economics
Environmental economics considers economic tools and analyses and their application in understanding environmental issues. Key economic concepts such as opportunity cost, marginal benefits and costs, and consumer and producer surplus are applied in examining the relationship between economic activities and the environment. The equimarginal principle, the Coase theorem, and the central concepts in cost-effectiveness and cost-benefit analyses are discussed. Case studies are used to illustrate the role of economics in evaluating environmental policies and regulations. The course also examines how business managers are meeting the environmental challenge. The question of how environmental problems and policies affect different groups within society is a central focus of the course. 1 Credit

ES8927 Risk Assessment in Environmental Mgmt
This course examines the application of risk analysis and assessment in environmental management. It reviews the methods of estimating probabilities and consequences of risks in the environment including new technologies, chemicals, biological agents and risk generating facilities. Risk analysis includes risk identification, risk pathways, exposure models and dose-response relationships. The course also sets out the principles of risk management and the process by which risks are perceived and communicated in making environmental decisions. A critical evaluation of risk assessment in environmental decision making is supported by a review of selected cases. 1 Credit

ES8928 Special Topics: Environmental Management
This course provides the opportunity for the program occasionally to offer a course in response to special non-recurring circumstances. The content will relate to specific topical areas related to environmental management that are not covered by existing courses. The particular timing, theme, and structure of the course will vary. 1 Credit

ES8929 Responding to Climate Change
This course provides an examination of the complex nature and underpinnings of the international discussion on anthropogenic climate change. The course reviews the technical and social concepts that must be addressed in a comprehensive understanding of the evolving response to the changing climate system, particularly within the context of the United Nations Framework Convention for Climate Change. 1 Credit

ES8930 Seminar: Env Appl Sci and Mgt
The seminar course introduces students to a range of environmental problems and the ways scientific analysis and management concepts, drawn from environmental science and management, can be applied. Seminars will include academic and professional experts who will present research and case reviews in environmental practice. Students will make a presentation on their research in progress for discussion with faculty and students. It is expected that students will have submitted their research proposals prior to enrolling. 1 Credit

ES8931 Management Fundamentals for Environmental Professionals
This course is an introduction to the principles of management and their application to business in the context of environmental management. Students are taught about the various functional areas of an organization, the strategic process, and environmental management systems. Topics include leadership and organization, accounting and finance, marketing, operations, risk management, strategic planning, and responsible business. Case studies are an integral part of the course. 1 Credit

ES8932 Sustainable Transportation
Transportation systems need to move people and cargo, efficiently, safely, and equitably in the cleanest ways to mitigate local pollution and other types of environmental damage. This course considers the sustainability of transportation from within and beyond cities. In this integrative project-based case analysis course, students creatively apply modern solutions, including academic and professional transportation planning tools, to envision the future of sustainable transportation. 1 Credit

ES8950 Indepdt Study Env Sci Mgmt, Masters
Individual directed study of subject areas in environmental applied science and management not addressed in the current curriculum will be carried out under the supervision of a faculty member. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. The independent study course is normally intended for students in the final semesters of study. 1 Credit

ES8951 International Environmental Field Research
Emphasis in this course is on the broadening of a student's perspectives by incorporating field experience in an international setting. The course provides an opportunity to undertake an individual (or group) research project under the direct supervision of a faculty member in the field. A program of supervised research will be developed collaboratively. 1 Credit

ES8953 Climate Change and Food Systems
Food production contributes substantially to climate change and environmental degradation. The food system is also vulnerable to climate effects. As such, the way the system functions puts food production at risk. Moreover this food system vulnerability is experienced inequitably by different groups. This transdisciplinary course explores these food challenges and unpacks the social, political, and historical context for them while considering evidence-based solutions and innovations that could lead to a more just food system. 1 Credit

ES8954 Power & Equity in Env. Practice
Managing the environment involves stakeholders with diverse interests (equity-seeking groups, NGOs, industry, government). We examine the intersection of science and politics, who is included/excluded in research, decision-making and related equity and justice implications. We consider colonial legacies underpinning research and management institutions and how knowledge and authority are being challenged and evolving beyond such institutions in an attempt to foster a more equitable environment. 1 Credit

ES8955 Environmental Forensics
Environmental forensics investigates the link between contamination in the environment and its source. This understanding can be used to hold polluters accountable, identify measures to reduce contamination, and enforce regulation. In this interdisciplinary course, students will learn the fundamental theoretical concepts as well as skills to plan and conduct environmental forensic investigations ranging from analytical chemistry to the investigation of historical records, and data science. 1 Credit

ES8956 Sustainable Product Design
Whether it be fashion or packaging - the production and overconsumption of "fast" products is depleting our natural resources, perpetuating inequality and contributing to environmental damage. This course bridges the science of sustainability with the needs of society and the environment through design. From innovative technologies - to metrics - to policy, case studies are used to appreciate life-cycle thinking, stewardship and strategic frameworks governing sustainable design. 1 Credit

ES8957: Anti-colonial research methodologies
This course examines the risks and rewards of researching in marginalized communities, taking into account the complicated histories and power differences that shape communities' relationships to research and researchers. Using decades of literature on anti-colonial theory and methodologies this course will guide students toward more equitable, ethical, and justice-focused research by considering the topics of intersectionality, decolonization, reciprocity, relationality, comradeship, and Indigenous methodologies. 1 Credit.

ES9001 Adv Studies in Env Policy Mgmt
This course provides an advanced and critical analysis of the relationship between public policymaking and environmental issues. Drawing from a range of theories and case studies, students will develop the skills to evaluate and understand how challenging and controversial themes in environmental science such as risk, complexity, evidence, expertise, technology, and institutions, shape and are shaped by the policymaking process. It is an interdisciplinary course that will require students to engage in critical discussion of a range of literature that has direct bearing on explaining how environmental issues, scientific evidence, and the policy process converge. 1 Credit.

ES9002 Research Methods: Env App Sc and Mgt
This seminar course involves study and application of methods appropriate to research in the environmental sciences and environmental management studies. It focuses on the challenges of engaging in research in a multi-disciplinary environment where students examine the conventions of research in their study areas. The purpose is to enable students to identify valid questions open to research and to introduce the methods needed to answer the question in ways that are unambiguous and supportable. 1 Credit

ES9950 Independent Study Envir Sci and Mgmt, PhD
Individual directed study of subject areas in environmental applied science and management not addressed in the current curriculum will be carried out under the supervision of the doctoral student's principal faculty supervisor. A program of supervised advanced study will be negotiated on an individual basis with the faculty supervisor. A proposal will require the approval of both the faculty supervisor and program director before enrollment. 1 Credit

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FASHION

CURRICULUM
First Offered Fall 2010

Master of Arts

DEGREE REQUIREMENTS		**Credits**
Master's Research/Creative Project		Milestone
FS8000	Graduate Seminar	1
FS8001	Research Methods	1
FS8002	Theory/History Seminar I	1
FS8003	Theory/History Seminar II	1
FS8004	Studio Workshop I	1
AND 4 elective credits		4

Electives		**Credits**
FS8006	Internship	1
FS8101	Digital Studio	1
FS8102	Fashion Entrepreneurship	1
FS8103	Globalization and Fashion	1
FS8104	Interactive Media	1
FS8105	Sustainable Fashion and Design	1
FS8106	Fashion and Race	1
FS8107	The Fashioned Body	1
FS8108	Fashion and Popular Culture	1
FS8109	Art in Fashion	1
FS8110	Critical Diversity in Fashion	1
FS8111	Special Topics Fashion Studies	1
FS8112	Directed Studies in Fashion	1
FS8113	Avant-Garde Fashion	1
FS8114	Critical Craft Studio	1
FS8205	Human Centered Design	1

Restricted electives

Students may select up to two of these electives		**Credits**
FS8202	Creativity in Design	1
FS8203	Curation and Exhibition	1

Master's Research/Creative Project
Students will research and develop solutions to issues in their chosen area of specialization as identified and explored in the First Year of the program. In consultation with faculty advisors, they may choose to develop a major paper on their topic or develop a creative project with a written component. This would relate to fashion, including: design, communication, technology, presentation, curation, history and theory, management, and new venture development. This is a Milestone. Pass/Fail

FS8000 Graduate Seminar
This seminar series covers topics related to graduate study and professional practice, including: student/supervisory relationships; research plans; internships; library research strategies/citations; writing academic abstracts; research/grant proposals; ethics protocols; participating at academic conferences; creating oral presentations and posters; developing your resume/career plan; utilizing blogs, social media and personal branding to translate your academic degree into industry practice. Pass/Fail 1 Credit.

FS8001 Research Methods
Students will be introduced to the theories, methodologies and methods that take into account creative, humanities-based and social scientific perspectives. A second goal of the course will be to familiarize students with the research and information gathering process, with the use of library and library resources, electronic and online research, and creative and unusual research strategies. The third goal is to provide an introduction to the art of project design and the writing of proposals. 1 Credit

FS8002 Theory /History Seminar I
This course introduces students to key issues in the development of the fashion system. Emphasis will be placed on studying the histories and theories of dress from the middle ages to the present, examining specific case studies and situating debates in their historical context. Taking into account developments in the production and consumption of dress, focus will be on the signifying systems through which dress attains social meaning, considering factors such as gender, social class and cultural relations through

trade. Students will critically assess and present readings in class, as well as complete assignments to increase their understanding of the factors and historical processes at work behind the fashion system in the West. 1 Credit

FS8003 Theory /History Seminar II
This course continues the study of critical debates and classic theories concerning the fashion system. Emphasis will be placed on developing analytical approaches to contemporary fashion, media and consumption while situating debates in their historical context. Discussions may include theories such as: production, marketing, and wearing of dress, gender, social class, sustainability as well as the visual and material cultures of clothing. Students will critically assess articles and current fashion events in the city, and will complete assignments designed to develop a solid understanding of current debates in the history and theory of fashion.
1 Credit

FS8004 Studio Workshop I
The Studio Workshop module focuses on the relationship between creative practice and academic theory and research. The course aims to challenge assumptions related to the production of knowledge and creativity. Emphasis is placed on exploration, the creative process and questioning disciplinary boundaries. Topics related to cultural and creative industries are discussed in relation to creative work and labour. Students have to opportunity to engage with academic theory and research through various practices including, but not limited to, apparel design, communication design, video, interactive media, performance, textile design, craft, and community engagement projects. 1 Credit

FS8006 Internship
Internship possibilities include working in publishing, theatre, fashion television; medicine, space and sports garment development; new media, gaming, inter-active and virtual run-way design; museums, galleries, special collections, conservation; brand development as well as opportunities in manufacturing and branding. The Internship will include a seminar to develop and evaluate the individual internship plans. Pass/Fail. 1 Credit

FS8101 Digital Studio
In this project based workshop, students will creatively explore various aspects of digital design. Though students will work largely independently, researching their own specific areas of interest, they will benefit from the guidance of faculty and present this work in class as it develops. Students will critique each other's work, and guest designers/researchers will focus the discussions towards theoretical, creative and practical considerations. It is expected that this multi-disciplinary approach will allow for interesting collaborations between students from a variety of backgrounds. 1 Credit

FS8102 Fashion Entrepreneurship
This course explores a variety of theoretical perspectives of entrepreneurship such as the social and economic function of entrepreneurs, cognitive and psychological aspects of entrepreneurs, and the new venture creation process as applied to the fashion industry. Students will have the opportunity to learn about entrepreneurs in the international and Canadian fashion industry by means of case studies, articles, seminars, and presentations. Students will write a research paper based on entrepreneurship theories and interviews with fashion entrepreneurs. 1 Credit

FS8103 Globalization and Fashion
Increasingly, the fashion world is perceived to be global in scale; apparel design, production and marketing is carried out on a transnational scale, and the language of fashion increasingly references the 'global' village, drawing on a variety of international and 'ethnic' design details and approaches. What are the implications and lived realities of this global fashion system? This course will examine theories and narratives of globalization in light of business practices, fashion communication technologies and outlets, and the growing attention to the formation, cultivation, preservation, and at times, exploitation of community and cultural values. 1 Credit

FS8104 Interactive Media
Increasingly, designers are using new media and interactive designs to express the concepts and ideas that inform fashion. This course works towards an understanding of interactive theory and explores emerging technologies including web designs, video, sound, installation, wearable technology , and additional emerging media related to fashion. 1 Credit.

FS8105 Sustainable Fashion and Design
The ethics and sustainability of design practices are coming under increasing scrutiny. Fashion, with its rapid cycles of production and consumption, is central to these debates. Starting with the Industrial Revolution, this course considers the historical trajectory of issues including mechanization, labour practices and human health in the textile and garment industries. With this context in mind, students then engage in debates over current and pressing problems such as the environmental impact of textiles, recycling, sustainability and labour markets. Students will produce a research paper or other approved creative project related to a specific topic covered in the course. 1 Credit

FS8106 Fashion and Race
This course will investigate the ways in which fashioned identities emerge within a racialized context in an effort to gain access, visibility and power–bridging key concepts in fashion studies with foundations in critical race theory, as well as methodologies from disciplines such as sociology, anthropology, art history and material culture. Discussions and exercises will address topics such as: Historicizing the Western beauty canon; cultural appropriation; and how the business of fashion grapples with race.
1 Credit

FS8107 The Fashioned Body
This course will address the historical and contemporary framing of the human form in Western culture, focusing specifically on the centrality of the body in the fashion systems of the past, present and future. Various theoretical approaches will examine the role and function of the body in a variety of contexts - from the marketing and imaging of bodies in the fashion industry, to a consideration of dress as a material form of cultural meaning and communication that is reliant on social ideologies of the body. 1 Credit

FS8108 Fashion and Popular Culture
The study of Fashion and Popular Culture draws on a wide variety of critical theoretical frameworks and examines a multitude of forms of cultural expression. This course looks at fashion across a diverse range of analog and digital media, including: literary texts, film, television, comics, music, advertising, sport, publishing and social media. Students will explore how these texts are produced, disseminated, interpreted and mobilized through the lens of communications and cultural studies approaches.1 Credit

FS8109 Art in Fashion
This course covers the complex and interrelated histories of art and fashion from the Eighteenth century to the present. Topics covered include: fashion and portraiture during the Romantic period; Pre-Raphaelite dress and nineteenth-century Aestheticism; Impressionism and the fashioning of modernity; Symbolism and the sartorial styles of the Fin de Siècle; twentieth-century avant-garde movements; and Postmodernism and contemporary clothing culture. 1 Credit

FS8110 Critical Diversity in Fashion
This seminar course explores the construction, negotiation and subversion of identity and difference through the production and consumption of fashion. We begin by exploring interdisciplinary theoretical perspectives on identity, diversity and inclusion. We then critically examine how people from various categories of identity—such as size, race, disability, gender and sexuality—experience, challenge and re-imagine fashion through fashion media and dress. 1 Credit

FS8111 Special Topics Fashion Studies
An advanced level seminar/studio course on topics to be determined. Program faculty members propose limited duration courses arising from major research projects or current issues. 1 Credit

FS8112 Directed Studies in Fashion
This course is for students who wish to gain knowledge in a specific area for which no graduate level classes are available. Students who are approved to take the course are assigned a suitable class advisor most familiar with the proposed content. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. 1 Credit.

FS8113 Avant-Garde Fashion
How do we free ourselves of limitations and conventions to generate emerging forms and concepts in fashion design? In the context of the rich history of Avant-Garde movements, this studio course takes on the challenge of creating design that expresses radical directions in aesthetics and intention. Through theoretical and practice-based methods, students engage with structured design problems to foster experimentation. Students explore alternative approaches to research-creation and criticality to reimagine and repurpose mundane items. 1 Credit

FS8114 Critical Craft Studio
This course explores craft practices, materials and artefacts through critical, social and cultural theories with a particular emphasis on fashion and textile-related practices. Topics include craft's relationships to art, design, technology, activism, community, economy, labour, class, identity, gender, culture, embodiment, and so forth. Students will participate in various practice-based workshops to acquire skills for further development in research-creation projects. 1 Credit.

FS8202 Creativity in Design
This course will explore creativity in design, concentrating on research and process. Referencing material from a broad spectrum of sources while exploring various techniques to enhance creativity, such as brain-storming, intrinsic motivation, lateral thinking and innovative forms of visualization, students will produce original work. Antirequisite: FSN 712. 1 Credit

FS8203 Curation and Exhibition
This studio course will allow students to work with the School's collection and others in order to learn sound curatorial practices. Students will have the opportunity to examine both private and public collections in order to curate small exhibitions and to develop catalogues which document, disseminate and critique garments, materials, accessories and designer's portfolios and other fashion related material. Antirequisite: FSN 711. 1 Credit

FS8205 Human Centered Design
Prioritizes design solutions engineered for the specific needs of the end user by actively involving them in the needs analysis and prototype design/development processes. This course focuses on the research and design of specialized products, services and environments for diverse target markets, specific demographics and ethnicities, health care, safety/protection, medical conditions, athletic activities, and for those individuals that are physically challenged with an overall emphasis on design innovation.
Antirequisite: FFD 510. 1 Credit

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FILM and PHOTOGRAPHY PRESERVATION AND COLLECTIONS MANAGEMENT
CURRICULUM

Master of Arts

DEGREE REQUIREMENTS	**Credits**
Major Research Project/Thesis	Milestone
Field Placement	Milestone
PP8001 MRP Development Seminar	1
PP8010 Internship	2
PP8102 Research Methods	1
PP8107 Digital Appl for Collectn Mgmt	1
PP8110 Cataloguing & Registrn Methods	1
PP8207 Digital Preservation	1

And one of the following specializations:

Photographic Preservation

PP8100 History of Photography I	1
PP8103 Photographic Collections	1
PP8104 19th Cent Photo Mater/Proc	1
PP8106 20th Cent Photo Mater/Proc	1
PP8108 History of Photography II	1
PP8109 Photographic Preservation	1
PP8111 Exhibition and Publication	1

Film Preservation

PP8150 History of film	1
PP8151 Film Materials and Processes	1
PP8153 Mgt of Film Collections	1
PP8154 Early Film and its Preservation	1
PP8155 Film Curation & Exhibition	1
PP8156 Film Production Processes	1
PP8206 Orphan Films	1

Students in the second year of the program may choose to remain in Toronto for their institutional residency or join partner institutions across Canada, US and Europe. Institutional partners include the Art Gallery of Ontario, the Ryerson Image Centre, Library and Archives Canada, Cinémathèque Quebecois, the National Gallery of Canada, the Metropolitan Museum of Art and the New York Public Library, The Museum of Fine Arts, Houston, the Musée Nicéphore Niépce, the Victoria and Albert Museum, London and the Swedish Film Institute

COURSE LISTING

Major Research Project/Thesis
The MRP/Thesis provides the opportunity to explore an aspect of film or photographic history, its preservation, or a collection management practice. The project is a sustained investigation, either an applied project, an academic argument, or a combination of the two that includes a discussion of a research question, situates that research within the appropriate intellectual and historical context, draws upon the relevant literature, and provides a technical or methodological analysis. This is a Milestone. Pass/Fail

Field Placement
The six-month Field Placement provides the opportunity to gain professional experience at one of the F+PPCM programme's partner institutions. It allows students to apply the theoretical, practical, and historical knowledge gained in the academic component of their studies to procedures and practices in collecting institutions, to acquire professional, collections management and research skills, to participate in institutional projects, and to secure career-appropriate experience. This is a Milestone. Pass/Fail

PP8001 MRP/Thesis Development Seminar
This seminar is designed to assist students with the development of their MRP/Thesis through the proposal, preliminary bibliography, outline, timetable, and oral report stages. The course is based on the premise that the successful conception, execution, and completion of an MRP/Thesis is a systematic process, one that is developed over a period of time in identifiable stages, each building upon the previous one. The course is practical in its orientation and is tailored to the needs of each student. Antirequisite: PP8000. 1 Credit. Pass/Fail

PP8010 Internship
For a minimum of eight and a maximum of twelve consecutive weeks, students will participate in the current activities or long-term plans of an institution. Students are strongly encouraged to undertake their internship during their third term and are required to present their internship experience in their fourth. 2 Credits. Pass/Fail

PP8100 History of Photography I
Using primary sources, this course provides a survey of the medium's history from early experiments to the present. It provides an overview of photography's development and its impact on society as both a cultural and sociological phenomenon. It familiarizes students with canonical and alternative histories of photography. 1 Credit

PP8102 Research Methods
This course aims to improve students' research skills in the histories of photography and film. Students will learn how to organize and execute historical research, and to understand the ethical collection, dissemination, and ownership of research data. With appropriate exercises, they will learn how to determine a research subject, how to build a bibliography, how to summarize scholarly papers and books, how to make oral presentations, and how to write a research essay. 1 Credit.

PP8103 Photographic Collections
This course studies photographic collections as specialized repositories of historical knowledge and cultural value. It identifies different types of public and private photographic collections as reflections of governmental, commercial, cultural, and community needs and describes their histories, purposes, intellectual organization and physical management. The course includes presentations by field specialists and/or visits to different sites and types of collections, their purposes and practices. 1 Credit

PP8104 Photographic Materials and Processes: The Nineteenth Century
This course provides a detailed investigation of the history and practice of major nineteenth-century photographic negative and positive processes, including photogenic drawings, calotypes, cased images (daguerreotypes, ambrotypes, and tintypes), wet-plate collodion negatives, and albumen prints through lectures, practical demonstrations, darkroom and studio experimentation, and relevant historical literature. 1 Credit

PP8106 Photographic Materials and Processes: The Twentieth Century
This course provides a detailed investigation of the history, practice, and the social and cultural implications of major twentieth century photographic negative and positive processes. These include platinum prints, gum bichromate prints, gelatin silver negatives and prints, chromogenic printing, instant photography, and digital printing. Students will learn through lectures, practical demonstrations, darkroom and studio experimentation, and relevant literature. 1 Credit

PP8107 Digital Applications for Collection Management
This course will investigate current theories and practices for the digitisation and representation of film and photographic archival materials. It will provide students with practical experience using digital technologies that facilitate the preservation of and access to both private and public collections. Workflow, management software and automation are explored in detail. 1 Credit

PP8108 History of Photography II
Using the collection of the Ryerson Image Centre and the Art Gallery of Ontario as its basis, this seminar provides the forum for students to investigate specific historical, cultural, political, or artistic issues arising out of the histories of photography. Students will gain a greater understanding of the medium and its social uses through a detailed examination and interpretation of original materials. Collecting and curating issues are also explored throughout the course. 1 Credit

PP8109 Photographic Preservation
This course provides an overview of the history of the philosophy, ethics, concerns, and methods of preservation. It covers the materials, tools, sources of supply, and ways of providing protection for photographs through proper mounting, housing, and stabilization procedures. It also covers the purposes and procedures for collection management. Students will also be introduced to conservation procedures in order to facilitate their interaction with conservators and their practices. 1 Credit

PP8110 Cataloguing and Registration Methods
This course provides an overview of the purpose and function of film and photography collection cataloguing and registration. It includes an overview of the function of registration and cataloguing staff, developing cataloguing systems and vocabularies, the roles and usage of collections management database technology, collections management procedures, shipping and receiving, insurance and condition reports. Analogue and digital collections management methodologies are discussed. 1 Credit.

PP8111 Exhibition and Publication of Photographs
This course is designed to provide students with an overview of issues and policies related to the exhibition and publication of photographs. It covers preservation issues involved in preparing, installing, monitoring, and circulating photographic exhibitions, as well as copyright and reproduction issues. Digital applications and issues are also discussed. The course culminates in a Public Exhibition. 1 Credit.

PP8150: History of Film 1
This course provides a historiographical overview of canonical and alternative film histories from the advent of sound to the present. It surveys the evolution of film genres, and considers the impact of film on society as both a cultural and socio-political phenomenon. The course will also explore topics in Canadian film history, including Indigenous and regional films. 1 Credit

PP8151: Film Materials and Processes
This course provides an overview of the diverse histories and practices of motion picture film processes as they are related to preservation. Archival film handling and inspection practices will be taught and supported by an investigation of the technical aspects of motion picture film including bases, gauges, element types, edge marks, soundtracks, and various forms of damage. Technical skills will be grounded in film preservation principles and ethical concepts. 1 Credit

PP8153 Management of Film Collections
This course is concerned with moving image (film, videotape, audio-visual digital materials) collections as specialized repositories of historical knowledge and cultural values. It examines issues surrounding the management and the accessibility of moving image materials, apparatus and ephemera in specific contexts. It studies different types of public and private moving image collections and describes their histories, purposes, intellectual organization and physical management. 1 Credit

PP8154 Topics in Early Film and its Preservation
This course aims to interrogate the social and cultural context of the first decades of motion pictures and analyzes the developments which helped shape the cinema's subsequent form as popular entertainment. The course critically examines the capitalist, colonial contexts for the global circulation of early cinema up to the advent of sound film, and questions the priorities of archival preservation. 1 Credit

PP8155 Issues in Film Curation and Exhibition
This course provides an overview of the ethical issues and policies related to the critically-engaged curation and exhibition of film. It covers collection appraisal and preservation issues involved in preparing, handling, monitoring, and circulating films for viewing, as well as copyright and reproduction issues. The course explores the practices around film exhibitions at galleries, museums, artist-run centres, community archives and specialty film societies. Film print projection will be stressed. 1 Credit

PP8156 Film Production Processes
This course will survey film and media production processes from the perspective of film archivists. Course content includes an analysis of the social and cultural implications of motion picture technology, colour processes and sound formats. Students will learn advanced film handling and repair, lab work procedures, print evaluations and how to inspect the unique physical qualities of the object during projection. 1 Credit

PP8206 Topics in Film Preservation: Orphan Films
Orphan films are unprotected, often without clear copyright, and include almost any non-commercial genre, from newsreels, regional documentaries, avant-garde and independent productions, to amateur works and scientific and ethnographic footage. To a large degree, the preservation of these films has fallen to non-profit and public organizations. This course will examine the role of orphan film preservation in protecting cultural and historical documents of disparate communities. 1 Credit

PP8207 Digital Preservation
This course investigates current theories and practices for the preservation of digitized and born-digital materials. Students learn how digital repositories work, the infrastructures, systems, policies and procedures needed for long-term preservation and access, including the identification of file formats and knowledge of relevant software and preservation-related metadata. The interaction of archivists and patrons with repositories and the ethics of digital procedures are emphasized. 1 Credit

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Health Administration (Community Care)

CURRICULUM

Master of Health Administration (Community Care)

DEGREE REQUIREMENTS		Credits
MH8001	Strategy in the Home and Comm. Care Sector	1
MH8002	Comparative Healthcare Policy and Management	1
MH8003	Management in Home and Community Care	1
MH8004	Performance in Home and Community Care	1
MH8005	Information Technology for Home and Community Care	1
MH8006	Research for Community Care	1

AND one of the following Options:

Capstone

MH8101	Seminar: Solving a Community Care Problem	1
MH8102	Teamwork and Leadership in Community Care	Pass/fail

OR

Major Research Paper * Milestone

*Option available under special circumstances with permission of Program Director

COURSE LISTING

Major Research Paper
Available under special circumstances with permission of Program Director
This is an individual Major Research Paper (MRP) that addresses a management or policy issue in the home and community care sector. Students prepare a paper that identifies the project goals, associated research questions and important background theory and evidence. The project will be applied in nature and require data collection or assembly. Similar to Capstone, students must prepare and present a proposal, mid-term update and final report. This is a "Milestone." Pass/Fail

MH8001 Strategy in the Home and Comm. Care Sector
This course will provide students with the opportunity to learn and apply strategic management concepts and tools as applied in the home and community care sector and its environment in Canada, with a particular focus on Ontario. Students will be introduced to the historical evolution of this sector to provide context to understand current issues/trends. Students will discuss and analyze the implications for governance and structure of, and alliances between for-profit and not-for-profit and public agencies that comprise this sector. The range (variation) of populations (i.e. paediatric, mental health, chronic illnesses, seniors) served within this sector, and the implications for equity, diversity and inclusion in providers will also be examined. 1 Credit

MH8002 Comparative Healthcare Policy and Management
This course introduces tools and data used to compare health care systems, highlights common policy issues and solutions and discusses implications for managers in this sector, which includes acute, long term and community care. Countries studied may include the US, UK, France, Germany, Japan and, as a benchmark, Canada. Principles of healthcare economics are discussed and applied to analyze and critique health and long term care systems and diagnose policy and management issues associated with insurance, paying providers, coordinating care and adopting technologies. 1 Credit

MH8003 Management in Home and Community Care
This course introduces and applies key management functions and related concept/ ideas as applied in organizations in the Home and Community Care sector. Mixing lectures and cases, scenarios and/or simulations, students acquire the language of management as they assess situations faced by coordinators and providers of care in the community. Key concepts covered include ethics, leadership, organization behaviour and theory, innovation and change management, entrepreneurship.. Management functions covered include human resources, marketing and entrepreneurship. Prerequisite: MH8001 1 Credit

MH8004 Performance in Home and Community Care
This course introduces students to concepts and associated research and analysis tools used to evaluate both clinical and financial performance in the home and community care sector. Program evaluation methods used to report and evaluate management process and clinical outcomes, such as collective impact assessments, are introduced and applied. Financial performance aspects covered include fundamental accounting principles as applied to preparing and interpreting financial reports. Clinical and financial reporting elements are integrated in the application of performance-linked funding models and preparations and evaluation of balanced scorecards. Prerequisite: MH8001 1 Credit

MH8005 Information Technology for Home and Community Care
This course introduces communication and information technologies used to deliver, facilitate, monitor and manage the integrated delivery of care to clients in the community. Topics include the collection, management and analysis of data generated by these technologies. Students will learn how these tools and applications are used by providers and clients and their families. Key policy and organizational issues associated with these technologies, as well as trends and prospects in this rapidly changing field are also covered. Prerequisite: MH8001 1 Credit

MH8006 Research for Community Care
This course is divided into four areas of competency for health managers related to research and evidence: methods, appraisal, communication, and implementation. Students will develop skills conducting, appraising, critiquing and summarizing quantitative and qualitative health research. Students will learn how to effectively communicate evidence to various stakeholder groups. Students will develop skills in decision-making and implementation science, recognizing the barriers and facilitators to research uptake in home and community organizations. 1 Credit

MH8101 Seminar: Solving a Community Care Program
This course is designed for students to apply critical thinking and knowledge, built throughout the program to real-world community care situations. Students, in small groups, complete a project about a policy, management and/or delivery issue facing an organization in the community care sector. Healthcare leaders from the organizations work alongside the faculty to mentor students in project development prior to and during project execution. Students gain experience translating knowledge through strategic and best---practice based methods to address 'problems' currently experienced by organizations in the sector.
Prequisites: MH8001, MH8002, MH8003, MH8004, MH8005, MH8006. Corequisite: MH8102 1 Credit

MH8102 Teamwork and Leadership in Community Care
Students in Capstone collaborate effectively as a team to produce viable and pragmatic case responses and capstone project deliverables that address key issues within a real-world context. In MH8102 students formally examine, apply and reflect upon teamwork and leadership principles, experiences and challenges encountered as they complete this project. Prequisites: MH8001, MH8002, MH8003, MH8004, MH8005, MH8006. Corequisite: MH8101 Pass/fail

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IMMIGRATION AND SETTLEMENT STUDIES

CURRICULUM (major revision Fall 2025)

Master of Arts

DEGREE REQUIREMENTS (Fall 2025 admissions)		**Credits**
IS8900	Theories of Immigration	1
IS8901	The Cdn Immigration Experience	1
IS8902	Settlemnt Experience in Canada	1
IS8903	Imm Law Policy Politics Pract	1
IS8904	Research Methods	1
Two credits from Elective List		2

AND one of the following options

Course and MRP Optiion

Major Research Paper — Milestone

OR

Practicum Optiion

Field Placement (252 hours) and Reflective Essay — Milestone

DEGREE REQUIREMENTS (prior to Fall 2025 admissions) FOR REFERENCE		**Credits**
Major Research Paper		Milestone
IS8100	Seminar and Field Placement	1
IS8901	The Cdn Immigration Experience	1
IS8902	Settlemnt Experience in Canada	1
IS8903	Imm Law Policy Politics Pract	1
IS8904	Research Methods	1
Three credits from Elective List		3

ELECTIVES		**Credits**
IS8921	Equity for Newcomers:Schools	1
IS8922	Changing Multicult Mosaic: GTA	1
IS8923	Immigrants' Voices in Cdn Lit	1
IS8924	The Economics of Immigration	1
IS8925	Glbl Migration & Pop Movements	1
IS8926	Women Immigration & Settlement	1
IS8927	Imm Fams & Intergenerat Rltns	1
IS8928	Law Enforcement in Cdn Imm Sys	1
IS8929	Issues of Aging in Settlement	1
IS8930	Race and Racialization	1
IS8931	Refugee Issues	1
IS8932	Immigration and Health	1
IS8934	Multicultural Cities–Planning Plcy	1
IS8935	Migration and Language	1
IS8936	Migration and Identities	1
IS8937	Directed Study	1
IS8938	Western Muslims and Liberalism	1

COURSE LISTING

Major Research Paper (MRP)
As a capstone project, students will conduct specialized research on a topic of their choice. A draft proposal for this topic will be developed through the required course IS8904 - Research Methods. The MRP research and writing will be conducted under supervision of a faculty member selected by the student. The MRP will be evaluated by the supervisor and a second reader, and will involve an oral review. This is a "Milestone". Pass/Fail

Field Placement and Reflective Essay
Students will complete a 252-hour field placement at an organization engaged in immigration or settlement policy or programs, allowing students to link classroom learning to work experience. During the Winter term, students attend presentations by practitioners on policy, service delivery, and advocacy. Typically, students complete their placement during the Spring/Summer term. Post-placement, students share their placement experiences at a symposium and submit a reflective-theoretical essay discussing their placement experience within a theoretical framework. This is a "Milestone". Pass/Fail

IS8100 Seminar and Field Placement
This course prepares students to complete a 150-hour field placement at an organization engaged in immigration or settlement policy or programs, allowing students to link classroom learning to work experience. During the Winter term, students attend presentations by practitioners on policy, service delivery, and advocacy. Typically, students complete their placement during the Spring/Summer term. Post-placement, students share their placement experiences at a symposium and submit a reflective report on their personal and professional learning. Pass/Fail

IS8900 Theories of Immigration
Students will explore well-established and recently developed theoretical frameworks analyzing human mobility, immigration, and settlement processes from various disciplines. The interdisciplinary nature of the immigration field and the diverse backgrounds of the ISS program students allow for a more comprehensive and nuanced analysis of diverse theories. Faculty members from different schools and departments across the university will teach and lead the course, bringing their expertise to discuss theories from different disciplinary understandings of human mobility. 1 credit

IS8901 The Canadian Immigration Experience
The Canadian immigration experience is a nexus of government policy towards newcomers and the lives immigrants have made for themselves through migration. This course assumes a historical perspective to explore current themes in the Canadian approaches to immigrant admission and belonging, including the significance of state authority, economic interests, presumptions of race and gender. In addition, it introduces students to contemporary concepts and approaches to understanding the experiences of migration and immigration. 1 credit

IS8902 The Settlement Experience in Canada
This course examines the experiences of immigrants and refugees who have settled in Canada, and the social, cultural and political processes of their integration and/or marginalization. In this context, it explores immigrant-based institutions and social movements, and equitable approaches to service provision and community development. Comparisons will occasionally be made to other countries. Students will develop an understanding of the migrants' lived experiences and the practical interventions that may reproduce or challenge processes of marginalization. 1 Credit

IS8903 Imm Law, Policies, Politics, & Practices
Immigration policy and law determine who is admitted to Canada. The formulation and implementation of immigration policy involves the complex integration of factors such as demographic trends, labour market conditions, human rights and the well-being and opportunity of immigrants. This course examines the politics of the decision-making process which defines Canadian immigration policy. Students will be encouraged to focus on policy analysis from the perspective of the immigrant, practitioner and the critic of immigration policy. 1 Credit

IS8904 Research Meth. in Imm. & Sett. Studies
This course is designed to prepare students to work on their required Major Research Paper (MRP) with a faculty supervisor. The principal components of this preparation are an articulation of one's research topic of interest, a thorough review of the existing literature on the topic, an overview of available methods, an explicit consideration of ethical issues in their research and student conference-style presentations to their classmates of their research ideas and methodological choices. 1 Credit

IS8921 Equity for Newcomers: Schools
Educational policies and practices routinely disadvantage migrants, and especially those without language skills in English or French. Educational equity in Canada will be explored in terms of: research and theory on social dominance; attempts by educational organizations to develop processes that are friendly to immigrant families; and research on the educational experiences of first and second generation immigrant children and their parents. 1 Credit

IS8922 Changing Multicultural Mosaic of the GTA
This course has two related objectives: to examine the migration and settlement experiences of diverse immigrant and refugee groups in the Greater Toronto Area (GTA), and in doing so, evaluate whether the GTA is indeed a multicultural space. Throughout this course, we will critically examine various concepts such as 'race', ethnicity, visible minority, class, gender, immigrant, refugee, and citizenship. 1 Credit

IS8923 Immigrants' Voices in Canadian Literature

The radical transformation of Canadian Literature into a robust body of writing occurred during the twentieth century, a period of intense immigration to this country. This course will examine a range of work by newly arrived and not-so newly arrived writers and will consider how identity is affected by the physical and cultural upheaval that characterizes the immigrant's experience. Whether and how the "self" is (re)constituted through immigration narratives will be considered. 1 Credit

IS8924 The Economics of Immigration
Labour economic theory and economic models of migration are applied to the context of immigration with particular emphasis on labour market outcomes of immigrants compared to the Canadian-born population. The topics include: effects of immigration on labour market outcomes; immigrants' earnings; and public spending and social assistance. Economic push and pull factors behind immigration flows are also examined, along with issues such as economic effects of migration on the source country. 1 Credit

IS8925 Global Migration & Population Movements
Scholarly records demonstrate that geographic mobility, not permanence, has been dynamic in shaping human settlements around the world. Historically the state often aimed to restrict population movements, however, sometimes it fostered migration through slavery, deportation, and colonialism. Today, ecological factors, demographic and economic pressures, political instability, wars, and social disruptions all precipitate voluntary and involuntary population movements. Interdisciplinary literature is reviewed, to compare patterns of population movements and migrations, and gendered relations of displacement globally. 1 Credit

IS8926 Women, Immigration, and Settlement
This course offers an analytical and theoretical orientation to understanding how immigrant women's lives are shaped by the intersection between gender, social class, race, ethnicity, and immigrant status. We will explore the history of Canadian immigrant women through the periods of colonization, agrarian transformation, nation state formation, industrialization, and globalization. Through these time periods, we will uncover patterns in the shaping of immigrant women's economic, political, and social rights, together with the attendant changing historical images of immigrant women. Particular attention will be paid to the changing nature of immigration policy, and immigrant women's settlement experiences – focusing on the multiple effects of immigrant status, gender, and race on employment and community life. 1 Credit

IS8927 Imm. Families & Intergenerational Relations
This course will explore family and intergenerational relations in the immigration and settlement process, premised on an appreciation of diversity in kinship and family structures. Continuities and changes in family relationships and roles are discussed, as they pertain to family separation and reunification, and transnational family lives. The experiences of elders, adults, youth and children are analyzed, in the light of the different sets of challenges they face in the receiving society. 1 Credit

IS8928 Law Enforcement in Canada's Imm. System
Terrorism, criminality, and undocumented migration are among the most contentious immigration issues. This course will address the legal and procedural mechanisms used to bar some people entry to Canada. We will discuss how and why Canada perceives threats to its public and national security interests, and what effect such definitions have on certain immigrant groups. We will shed light on the perspectives of both the law enforcement establishment and potential entrants to Canada. 1 Credit

IS8929 Issues of Aging in Settlement
This course examines some of the historical, sociological, legal, and residential issues that are part of the immigration and settlement experience of older immigrants to Canada. Their issues revolve around the economic, social, and other supports available from family, friends and the wider community. We will address how gender, race, language, and education combine to inform the experiences of exclusion and inclusion, dependency and independence, of aging immigrants in Canadian society. 1 Credit

IS8930 Race and Racialization
This course is constructed on the premise that racism and ethnocentrism have been and continue to be prominent features of Canadian society, which have challenged the dominant institutions. The course will examine the historical roots, contemporary manifestations and continual reproduction of racism, starting at the point of first contact between European colonizers and Aboriginal peoples, and continuing to draw examples from the subsequent patterns of immigration including the most recent attention to racialized minority immigrants. 1 Credit

IS8931 Refugee Issues
Refugees are populations and individuals who have been displaced across and within borders for reasons of persecution, expulsion, war, violence, and violations of fundamental human rights, security, and livelihood, including environmental causes. This course will address the accommodation, protection, and assistance for refugees through asylum, settlement, resettlement and reintegration. The policies and actions of governments and non-governmental organizations are explored critically, based on an analysis of the multiple consequences on refugees' lives, of their displacement. 1 Credit

IS8932 Immigration and Health
Newly arriving immigrants are, on average, healthier than native-born Canadians. They do not always stay that way. This course will address personal and social determinants of physical and mental health, and paradigms used to explain the health status of immigrants. Culturally appropriate health care requires institutional change, but this has been slow in coming. We will examine why, despite universal coverage, Canada's health care system is still failing to provide equitable services for immigrants and refugees. 1 Credit

IS8934 Multicultural Cities-Planning Policy
Recent immigration patterns have prompted an exploration of local governments' provision of urban facilities, services and infrastructures. We will address how modern cities of diverse cultures evolve and what policy approaches can sustain them. The course offers a mix of theoretical explanations about the geographic, political and economic bases of multicultural cities and a critical review of current policies and planning practices. It compares cities around the world, with a focus on Greater Toronto Area. Antirequisite: PL8101. 1 Credit

IS8935 Migration and Language
Many newcomers to Canada arrive with a good knowledge of one official language, which makes their integration to Canadian society much easier. Others, though, for whom English and French are not familiar languages face several obstacles to their full integration. In this course, students will be presented with the current status regarding language accommodations in the public sector, while being made aware of some of the difficulties associated with language in implementing Canada's immigration policies. 1 Credit

IS8936 Migration and Identities
Theoretical approaches are introduced regarding the connections between migration policies and practices, and the people who engage in them. The main approaches are feminist, critical race, and queer theory, and theories of citizenship belonging. We will engage in critical analysis of transnational and intra-national movements of migration while attending to how identities are shaped in the process. We will explore identities and migration and their connection to the state, social institutions, and personal experience. 1 Credit

IS8937 Directed Study
This course provides for individual directed study of a subject area in Immigration and Settlement Studies not available in the curriculum. The course is carried out under the supervision of a faculty member, and requires a program of supervised study and regular meetings between a student and a faculty member in an area of study related to the student's area of research.
1 Credit

IS8938 Western Muslims and Liberalism
This course examines the experiences of Muslims in Western liberal societies as citizens and social-political subjects rather than cultural aliens or permanent immigrants. Using contemporary approaches in migration studies such as transnational practices, cultural hybridity and pluralism we will develop a complex analysis of recent instances when notions of "Muslim" identity or '·Islam' were seen to clash with liberal individualism, democracy and human rights in Western Europe and North America. 1 Credit

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INTERIOR DESIGN

CURRICULUM
Major revision Fall 2025

Post-Professional Master of Interior Design
First offered Fall 2023 edited for Fall 2024

DEGREE REQUIREMENTS		Credits
ID8100	Design Research Seminar I	1
ID8101	Design Research Seminar II	1
2 Electives		2

AND one of the following options

Major Research Paper (MRP) Option

Creative Project/MRP	Milestone

Course Only Option

2 Electives	2
Summary Paper	Milestone

Experiential Learning through Faculty SRC

Collaborative Project	Milestone
Summary Paper	Milestone

Master of Interior Design
First offered Fall 2025

DEGREE REQUIREMENTS		Credits
ID8100	Design Research Seminar I	1
ID8101	Design Research Seminar II	1
ID8110	Interior Design Studio I	3
ID8111	Interior Design Studio II	3
ID8112	Interior Design Studio III	3
ID8113	History of Interior Design	1
ID8115	Professional Study	1
ID8114	Psychology and Design	1
ID8116	Professional Study Practicum/Internship	Pass/Fail
2 Electives		2

AND one of the following options

Major Research Paper (MRP) Option

Creative Project/MRP	Milestone

Course Only Option

2 Electives	2
Summary Paper	Milestone

Experiential Learning through Faculty SRC

Collaborative Project	Milestone
Summary Paper	Milestone

Electives

ID8201	Furniture Design	1

ID8202	Textiles	1
ID8203	Advanced 3D Visualization	1
ID8204	History of Textiles	1
CD8310	Critical Approaches to Cultural Comm.	1
CD8320	Media Lang: Forms, Approaches	1
CD8330	Audiences and the Public	1
CD8340	Media Writing: Critical & Narrative Forms	1
PC8105	Proposals, Grants, Fundraising	1

COURSE LISTING

Creative Project/MRP
The year-long Creative Project/MRP affords students the opportunity to pursue a topic of their interest that contributes to the interior design body of knowledge. Projects will be developed through phases informed by research that should broaden a student's knowledge of the discipline by demonstrating design/research inquiry, theoretical underpinnings, and written reflection. A public jury composed of faculty and external reviewers will assess the final Creative Project/MRP. This is a Milestone

ID8100 Design Research Seminar I
This course will examine how objects, interiors, spaces and the built environment represent the transferal embodiment of ideas about culture, society, and identity. Interested in the historical and contemporary relationships of human society to objects and spaces - whether in their creation or use - this course will address ideas about style and substance as relating to the issues and concerns that define the design profession. 1 Credit

ID8101 Design Research Seminar II
Design|Research Seminar II offers students the fundamentals to situate their design|research in historical contexts, with an emphasis on gathering visual, textual, and other resources, demonstrating historical awareness and present innovations. Students will draw on weekly seminar discussions to draft the literature review and/or precedent studies for their MRP. 1 Credit

ID8110 Interior Design Studio 1
Interior Design Studio 1 introduces students to fundamental properties that inform studio-based problems such as program, scale, site, construction and representation. Specific elements introduced include enclosure, material awareness, design precedent, structures, human behaviour, ornament and details. These elements are coalesced and conveyed using analogue and digital drawings, along with workshop experience to produce three-dimensional models. 3 Credits

ID8111 Interior Design Studio 2
Students undertake a design project in order to synthesize knowledge gained from the previous semester and concurrent courses addressing representation techniques, technology, construction and presentation. The design problem frames relevant themes in urban environments such as adaptive reuse, sustainability and mixed-use typologies. Together, these require students to address non-structural and construction techniques, place-making strategies, integrative technology, materiality and details. The unity of these attributes are represented using techniques that express a comprehensive project, from diagrams to construction documents. 3 Credits

ID8112 Interior Design Studio 3
Students undertake a design project for a public program at the scale of a workplace environment or similar, in order to develop design strategies that address ergonomics, human factors, building systems, construction standards and codes, and atmospheric conditions of lighting, acoustics and thermal comfort. Students will synthesize these elements into a cohesive design solution with the integration of health, safety and welfare demonstrated through drawings, models and materials. 3 Credits

ID8113 History of Interior Design
This course explores the history of domestic, commercial, and public interiors from the beginning of the Industrial Revolution to the present day. Students will explore interiors from the Victorian period, through early and mid-century modernist movements, to contemporary interiors around the world. This course emphasizes the many social, political, material, and technological influences that shape the interior. 1 Credit

ID8114 Psychology and Design
Psychology and Design studies environmental psychology in the context of design practice. The course examines interaction between environments (built and natural) and human behaviours. Through discussions of research and illustrations from design considerations, the course incorporates fundamental environmental psychology theories into design practice. Particular emphasis will be placed on the impact of design principles on individuals' physical and mental health. 1 Credit

ID8115 Professional Study
This course prepares students for the Practicum (Internship). Students will be expected to demonstrate knowledge of interior design firm practices. Topics such as small business management, marketing, promotion, presentations, fee methods, the scope of services, job descriptions, contracts, ethics, and accounting are reviewed. Project management contract documentation, budgeting, and scheduling will be further examined. 1 Credit

ID8116 Professional Study Practicum
Field placements in design offices, and/or other valid experiences approved by the Interior Design program, will introduce students to hands-on work experience. In addition to applying academic skills and theoretical perspectives acquired in the program, students will learn to work effectively within the interior design profession. A total of 400 hours of field placement work experience is required for full credit. This course is normally completed during the summer term. Pass/Fail

ID8201 Furniture Design
The bench is recognized as one of the most primitive forms of furniture through its numerous unique iterations of form and function in both ancient and contemporary cultures throughout the world. Sound structure, material usage, workable and elegant joinery, anthropometrics, ergonomics and excellent craft are important considerations in final grades. Classes are conducted in the wood shop and in studio. Activities will include demonstrations of techniques, lectures, presentations, desk reviews, group discussion, and one-on-one attention during the fabrication process. 1 Credit

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D8202 Textiles
This course exposes the student to the complex world of how textiles are designed and created for interior design application based on personal exploration of creating actual sample of a woven textile as well as print design samples. The student will investigate the various fibres used in textile creation, the meaning of the technical terms used in the textile industry and the implication to the environment of appropriate textile selection. 1 Credit

ID8203 Advanced 3D Visualization
In this course students will use innovative methods of three-dimensional manual and computer generated visualizations. A variety of available graphic media and software products will be explored for the development of a presentation portfolio. 1 Credit

ID8204 History of Textiles
This course is an introduction to the study of textiles and fibres within the social, economic and political systems taken from a cross-cultural perspective. A broad history of textiles and textile production will be the primary focus of study with an in-depth review of Canadian textile history. 1 Credit

CD8310 Critical Approaches to Cultural Comm.
This course engages critical theories on race, Indigeneity, class, and gender to interrogate notions of cultural competence, cross-cultural and intercultural communication that permeate the study and practice of communication. We ask: who determines culture? What social structures are reinforced in theories and practices of culturally competent communications? We also critically explore how traditional notions of culture are communicated and reinforced across various genres, media, and contexts. 1 Credit

CD8320 Media Lang: Forms, Approaches
This interdisciplinary course will investigate both common elements (visual and auditory narratives, methods of presentation/distribution, cultural roles) and specific attributes (individual characteristics and technologies) of contemporary media forms. Key developments in the evolution of media types and media languages will be explored in the larger context of understanding critical and theoretical issues associated with these forms and languages. 1 Credit

CD8330 Audiences and the Public
The course addresses the challenges concerning value creation and the effective design and delivery of media/mediated products and services from the perspective of the audience. The course brings an interdisciplinary conceptual framework to bear on contemporary media and mediated consumption to investigate five principal ways of audiencing (citizen, spectator, customer, user and player) as well as the new audience sociability and several key issues around managing it: metrics, presumption, fans, transmedia, and business models. 1 Credit.

CD8340 Media Writing: Critical & Narrative Forms
This course will explore issues of form, expression and viewpoint in writing for contemporary visual arts and media. The emphasis will be on essays and critical studies, but writing of summaries, proposals and analyses will also be covered. Traditions of literary and arts criticism form a basis for study of contemporary writing practices for both print and screen-based media. 1 Credit

PC8105 Proposal Writing, Grant Seeking and Fundraising
This course provides a detailed introduction to the multidimensional processes of grant-seeking and the strategic principles of writing proposals for research funding and non-profit fundraising. Through a theoretical framework grounded in classical and modern rhetoric, meta-rhetoric, and narratology, students will explore how professional communicators construct polished arguments to generate support. From the perspective of both grant seekers and multidisciplinary peer-review audiences, students will learn how to identify and target government, foundation, and corporate funding sources/opportunities, to translate project goals and problem statements into clear objectives and hypotheses reflective of societal need, and to coordinate activities in the planning, development, structuring, and articulation of feasible, methodologically rigorous, and conceptually innovative research projects/proposals. Students will also gain practice in applying these techniques to fundraising initiatives and tasks including outreach and the cultivation of potential foundation and corporate donors. 1 Credit

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MANAGEMENT

CURRICULUM
First Offered Fall 2020

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
Comprehensive Examination		(Milestone)
Proposal Defence		(Milestone)
Dissertation		(Milestone)
MG9101	Management and Organization Theory	1
MG9102	Advanced Research Methods Qualitative	1
MG9103	Advanced Research Methods Quantitative	1
MG9110	Research Seminar 1	Pass/Fail
MG9111	Research Seminar 2	Pass/Fail
MG9112	Research Seminar 3	Pass/Fail
	One of	
MG9201	Digital Enterprise and Social Media	1
MG9202	Real Estate Studies	1
MG9203	Retail and Consumer Services	1
MG9204	Strategy Innovation and Entrepreneurship	1
MG9207	Readings: Sustainability	1
MG9208	Directed Readings: Accounting	1
MG9209	Directed Readings: Finance	1
MG9210	Directed Readings: Law + Ethics	1
MG9211	Directed Readings: HR/OB	1
MG9210	Readings: Intl Business	1
	And	
Two Electives		2

ELECTIVES		**Credits**
MG9201	Digital Enterprise and Social Media	1
MG9202	Real Estate Studies	1
MG9203	Retail and Consumer Services	1
MG9204	Strategy Innovation and Entrepreneurship	1
MG9205	Directed Readings	1
MG9206	Special Topics: Management	1
MB8110	Integrating AI: Business Process Management Perspective	0.5
MB8111	Negotiation and Conflict Management	0.5
MB8113	Dynamic Decision Making and Problem Solving	0.5
MB8114	Organizational Decision Making	0.5
MB8116	Acquiring Consulting Skills & Processes	0.5
MB8117	Project Management	0.5
MB8118	Brand Management	0.5
MB8119	Cases in Corporate Finance	0.5
MB8121	Disruptive Digital Transformation	0.5
MB8122	International Finance	0.5
MB8123	Professional Sales	0.5
MB8124	Social Media Analytics	0.5
MB8125	Developing Your Startup	0.5
MB8126	Talent Management	0.5
MB8127	Investment and Portfolio Management	0.5
MB8128	Starting Your Start-up	0.5
MB8129	Understanding Consultants & Consulting	0.5
MB8130	Strategic HRM	0.5
MB8131	Sourcing Digital Services	0.5
MB8132	Causality and Causal Inference Methods	0.5
MB8133	Personal Finance	0.5
MB8134	Mental Health and Wellbeing in the Workplace	0.5

MB8135	Sport Business Strategy	0.5
MB8136	Sport Business Marketing	0.5
MH8001	Strategy in the Home and Community Care	1
MH8002	Comparative Health-Care Policy	1
MH8003	Management in Home and Community Care	1
MH8004	Performance in Home and Community Care	1
MH8005	Information Technology for Home and Community Care	1
MH8006	Research for Community Care	1
SM8103	Applied Research Methods I	1
SM8104	Applied Research Methods II	1
SM8219	Theories of Technology and Organizations	1
SM8721	Service Innovation Management	1
SM8722	Special Topics	1
SM8723	Advanced Data Analytics in Business	1

Course Listing

MG9101 Management and Organization Theory
Each week, two theories from a list of 40 will be selected for systematic analysis of their ontological assumptions, knowledge interests and epistemological implications. For each of the two theories two empirical research papers will be reviewed and critically analyzed to enable the students to understand the special challenges of operationalizing the theories in organizational research. 1.0 Credit

MG9102 Advanced Research Methods Qualitative
Topics will include: historical roots, philosophical assumptions, theoretical framework, and implications of different qualitative approaches; research design; data collection, analysis, and interpretation strategies; critical evaluation of qualitative studies, and research grant writing for a qualitative study. Students will develop their capacity to conduct qualitative research through hands-on projects. This course covers the key concepts and methods of qualitative research. 1.0 Credit

MG9103 Advanced Research Methods Quantitative
This course explores quantitative analytical techniques, allowing students to design research projects and conduct necessary quantitative analysis. During empirical studies, it is important to understand the benefits and drawbacks of various techniques so that students choose appropriate techniques to address research questions tested. The focus will be on gaining an understanding of what the various statistical techniques can do, what is the most effective technique, how to apply them and interpret the results. 1.0 Credit

MG9110 PhD Research Seminar 1 The purpose is to expose students to current research in the TRSM including the paradigmatic approaches and methodologies employed to address management research questions. The exposure will aid in the development of the students' own research ideas and implementation. To pass the course, within three terms students will attend and reflect on a minimum of seven research presentations. Pass/Fail

MG9111 PhD Research Seminar 2
The purpose is to expose students to current research in the TRSM including the paradigmatic approaches and methodologies employed to address management research questions. The exposure will aid in the development of the students' own research ideas and implementation. To pass the course within three terms students will attend six seminars and present a paper at a conference or equivalent venue. Pass/Fail

MG9112 PhD Research Seminar 3
The purpose is to expose students to current research in the TRSM including the paradigmatic approaches and methodologies employed to address management research questions. The exposure will aid in the development of the students' own research ideas and implementation. To pass the course, within three terms students will attend five seminars, present a paper, and organize a research seminar. Pass/Fail

MG9201 Digital Enterprise and Social Media
This course aims to introduce students to the overarching concepts, ranging from technical to managerial, that are critical for the functioning of the digital enterprise, the modern networked organization driven by digital technologies and data. After a high-level coverage of these concepts, the focus is on seminal theories that attempt to explain how individuals, organizations, and society interact with information and communication technologies and the dynamics caused by technological progress. 1.0 Credit

MG9202 Real Estate Studies
This course presents various research topics in the growing areas of real estate. The course will prepare students to develop their own research agenda or pursue their own research interests that can be published in top economics and finance journals. As a result of the rapidly-growing field, the reading list is evolving and may be supplemented. Papers selected include both published and working papers and cover long-standing and current research questions. 1.0 Credit

MG9203 Retail and Consumer Services
This course explores theories and topics related to retail and consumer behavior research. The course comprises of intensive readings, critical analyses of published research papers, and developmental writing. The course provides a survey of classic papers as well as recent theoretical developments in this topic domain. Topics addressed in this course are designed to complement other PhD seminars, while introducing the topic domain. 1.0 Credit

MG9204 Strategy Innovation and Entrepreneurship
This course explores theories related to entrepreneurship and strategy research. The course comprises of intensive readings, critical analyses of published research papers, and developmental writing. The course provides a survey of classic papers and recent theoretical developments in this topic domain. Topics addressed in this course are designed to complement other PhD seminars,

while introducing everyone to the topic domain. Students will have opportunities to interact with Ryerson's innovation and entrepreneurship ecosystem. 1.0 Credit

MG9205 Directed Readings
This course gives students space to study literature that explores the full theoretical and contemporary scope of readings pertaining to a proposed field of specialization under the guidance of the professor. The course will involve an in-depth review of the literature in a particular area guided by a member of the faculty. Students must seek out the approval of a faculty Supervisor prior to enrolling in this course. 1 Credit

MG9206 Special Topics: Management
Management This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The particular course description will be announced prior to scheduling the course. 1 Credit

MG9207 Readings: Sustainability
Our proposed PhD specialization in sustainability integrates courses from environmental sciences, strategic management, and social sciences, offering a comprehensive understanding of sustainability. Unique in its focus on how human behavior shapes decisions in the marketplace, organizations, and society, the program stands apart from traditional sustainability programs. With faculty from diverse business disciplines, it fosters collaboration, encouraging innovative research to address complex sustainability challenges in today's interconnected world. 1 Credit

MG9208 Directed Readings: Accounting
The accounting profession is undergoing significant transformation due to technological advancements and challenges faced by democratic institutions, impacting economic governance and social equity. Accounting is now crucial for sustainable resource use and accountability to stakeholders. In response, accounting research spans areas like managerial and financial accounting, taxation, performance management, sustainability accounting, and auditing. We propose a new PhD specialization in Accounting at TRSM, aiming to address contemporary challenges and promote accountability and ethics in academic research. 1 Credit

MG9209 Directed Readings: Finance
The PhD specialization in Finance offers academic education in subfields such as Corporate Finance, Empirical Asset Pricing, Personal Finance, Banking, International Finance, Public Finance, and Investments. Aligned with Toronto Metropolitan University's priorities, this specialization fills gaps in Finance academic training in the Greater Toronto Area (GTA). It supports TRSM's goals by enhancing research capabilities to address real-world challenges, fostering leadership, and generating research that improves economic prosperity nationally and internationally. 1 Credit

MG9210 Directed Readings: Law + Ethics
The proposed PhD specialization in Business Law and Ethics will train students to systematically address legal and moral questions in business. It targets academics and professionals, enhancing TRSM's offerings. Focused on law, ethics, and business, it promotes ethical leadership, responsible practices, and risk management. Aligning with TRSM's research priorities, it fosters interdisciplinary integration of ethical and legal knowledge, enriching graduate education and addressing emerging legal challenges in global commerce. 1 Credit

MG9211 Directed Readings: HR/OB
This course considers theories and research that focus on the behaviour of people at work. The emphasis will be on broad theories that can apply to a wide range of contexts and situations such as job attitudes, organizational justice, motivation, and organizational deviance. The goal is to provide a common knowledge base from which relevant theoretical, methodological, and practical issues can be addressed. Students will consider how they can apply these theories to advance their own research interests. 1 Credit

MG9210 Readings: Intl Business
This course explores theories and research on the global business environment and socially conscious leadership from local to global perspectives with an entrepreneurial focus. Emphasis is placed on ethics, sustainability, and social responsibility in international business. Students will examine how to apply these concepts to support their own research interests in the context of an evolving global landscape. 1 Credit

For course descriptions of non MG courses, go to the Program offering the course. MB – Master of Business Administration MH – Master of Health Administration SM – Master of Science in Management

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MASTER OF BUSINESS ADMINISTRATION

CURRICULUM

Professional Master's Diploma

DIPLOMA REQUIREMENTS

PMDip Enterprise Information Security, Privacy and Data Protection not currently offered

		Credits
MT8911	Technical Foundation for Mgrs	1
MT8912	Mnging for Max Benefit and Eff	1
MT8913	Security and Privacy Mgmt Fundmtls	1
MT8914	Law, Cmplce, Aud and Cert, Comp Crime	1

PMDip Accounting

		Credits
MT8916	Advanced Financial Accounting	1
MT8917	Management Accounting	1
MT8918	Advanced Auditing and Assurance	1
MT8919	Advanced Finance	1
MT8920	Accounting Taxation Integration	1

PMDip Finance for Social Innovation not currently offered

		Credits
MT8931	Corporate and Non-Profit Governance	1
MT8932	Alternative Perspectives on Finance	1
MT8933	Investing for Impact	1
MT8934	Financing and Assessing Social Impact	1
MT8935	Capstone Project in Finance for Social Innovation	1

PMDip Financial Analysis not currently offered

		Credits
MT8940	Fixed Income Securities	1
MT8941	Advanced Portfolio Management	1
MT8942	Advanced Investment Management	1
MT8943	Derivatives	1
MT8944	International Finance	1

PMDip Management of Technology and Innovation not currently offered

		Credits
MT8212	Innovation and Org Theory	1
MT8213	Technology and Org Strategy	1
MT8216	Global Markets and Tech Trends	1
MT8945	Executive Leadership for CIOS	1
MT8946	Capstone – MTI for CIOs	Pass/Fail

Master of Business Administration
(revised Fall 2020)

DEGREE REQUIREMENTS

*Foundation Courses**		**Credits**
MB8002	Quan Mthds for Bus	1
MB8004	Accounting	1
MB8005	Finance	1
MB8006	Economics	1
MB8007	Principles of Management	1

* Students with an undergraduate degree in business may apply for advanced standing in the Foundation courses.

AND the requirements for the *MBA* as set out below

Core Program		**Credits**
MB8010	Strategy in a Disruptive Marketplace	1
MB8011	Leading for Performance and Wellbeing	1
MB8012	Managing Customer Value	1
MB8013	Managing Responsibly	1
MB8014	Innovation and Technology Management	1
MB8015	Business Analytics for Managers	1
MB8019	Financial Management	1

Three credits total from the available Electives 3

AND one of the following options**:**

MB8016	Capstone Project – Consulting Project	Pass/Fail
MB8017	Capstone Project – Entrepreneurial Project	Pass/Fail
MB8018	Capstone Project – International or Canadian Experience	Pass/Fail

Electives (note: all electives are 0.5 credit value)		**Credits**
MB8110	Integrating AI: Business Process Management Perspective	0.5
MB8111	Negotiation and Conflict	0.5
MB8112	Predictive Analytics for MBAs	0.5
MB8113	Dynamic Decision Making and Problem Solving	0.5
MB8114	Organizational Decision Making	0.5
MB8115	Fundamentals of Data Science for Management	0.5
MB8116	Acquiring Consulting Skills & Processes	0.5
MB8117	Project Management	0.5
MB8118	Brand Management	0.5
MB8119	Cases in Corporate Finance	0.5
MB8120	Data Science for MBAs	0.5
MB8121	Disruptive Digital Transformation	0.5
MB8122	International Finance	0.5
MB8123	Professional Sales	0.5
MB8124	Social Media Analytics	0.5
MB8125	Developing Your Startup	0.5
MB8126	Talent Management	0.5
MB8127	Investment and Portfolio Management	0.5
MB8128	Starting Your Startup	0.5

MB8129	Understanding Consultants & Consulting	0.5
MB8130	Strategic HRM	0.5
MB8131	Sourcing Digital Services	0.5
MB8132	Causality and Causal Inference Methods	0.5
MB8133	Personal Finance	0.5
MB8134	Mental Health and Wellbeing in the Workplace	0.5
MB8135	Sport Business Strategy	0.5
MB8136	Sport Business Marketing	0.5
MB8137	Pop-up Topics in Management	0.5
MB8138	Directed Reading	0.5

Course Listing (MBA)

MB8002 Quan Mthds for Bus
This course equips students with basic analytical tools that support business decision making. Students learn the principles of statistics and other techniques and apply them to data analysis using computer-based tools. In addition, students develop a broader understanding of the information systems that supply these data, and how quantitative analyses support management and strategy in business organizations. 1 Credit.

MB8004 Accounting
Topics include the role of GAAP, balance sheet, income statements and cash flow statements, the concepts of retained earnings, depreciation, receivables, inventory, amortization, deferred taxes and goodwill. It examines accounting models to improve managerial decision making including the Cost-Volume Profit model, Activity Based Costing, Economic Value Added, transfer pricing, overhead allocation and Balanced Scorecard. Strategic issues such as organizational learning, control systems and open-book management are examined with a global perspective. 1 Credit

MB8005 Finance
This course provides the necessary principles of finance for the manager of an enterprise in the global environment. This course examines from a global perspective, shareholder wealth maximization, the analysis and interpretation of financial statements, ratio analysis, the time value of money, discounted cash flow analysis, valuation of different financial assets, value of equity, interest rate analysis, the value of debt, and bond valuation. 1 Credit

MB8006 Economics
This course develops the fundamental tools of economic analysis that are essential for understanding global markets and making managerial decisions. The economic relationships between growth and inflation are examined as well as credit, interest rates, and government fiscal and monetary policy. International input and product markets, foreign direct investment, multinationals, mergers and acquisitions, as well as the market determination of exchange rates and interest rates are considered. 1 Credit

MB8007 Principles of Management
The course comprises a tour through the non-financial management functions. It begins with an outline of the history of management thought, an approach that frames the successive topics. It is followed by a unit on business law and corporate governance, which explains the roles and responsibilities of managers and executives. The organizational behaviour/human resource section highlights principles of social psychology as they relate to how people interact in organizations, and small groups. The section on operations and management information systems shows how organizations use technologies. The quality unit shows how it is fostered in manufacturing and services. The marketing module introduces the first principles of this function. There is also a lecture introducing the unique aspects of entrepreneurship and small business. 1 Credit

MB8010 Strategy in a Disruptive Marketplace
This course provides students with the strategic foundation around which they can build their MBA journey. It is a dynamic course, requiring significant advance preparation, both individually and in groups, and extensive class interaction. Students will be exposed to both traditional approaches to strategy and the new dynamic world in which organizations must now compete. Students will address both multi-divisional corporate strategy issues as well as specific strategic choices for individual business units. 1 Credit. *Anti-requisite MB8103 or MT8213

MB8011 Leading for Performance and Wellbeing
This course will expose students to key theories of leadership, central debates about the obligations of leadership, the role of leaders in modern organizations, and the importance of self-awareness for effective leadership. The goal of this course is to encourage thinking critically about leadership as both a practice and a field of study. Through an examination of theoretical and popular conceptualizations of leadership, case analysis, applied readings, and self-reflection, the material is designed to develop abilities as a leader and a follower. 1 Credit.

MB8012 Managing Customer Value
This advanced marketing course examines the delivery of value from B2C and B2B perspectives. It focuses on how management of relationships and processes across the value chain contribute to the delivery of value to stakeholders, including shareholders, customers, and community members. The course provides insight into marketing strategies and actions that disrupt the marketplace, society, and sustainability. 1 Credit.

MB8013 Managing Responsibly
This course focuses on the relationship between law, ethics, and corporate social responsibility as they relate to management. Students learn the importance of law as a facilitator in developing successful business strategies and explore the mutuality reinforcing relationship between law and corporate social responsibility in areas such as corporate governance, environmental protection, privacy, corruption, and free trade agreements. Through an examination of these themes, the course provides students with analytical tools for identifying ethical problems and a framework for managing ethical conduct in organizations. 1 Credit. *Anti-requisite MB/MT8108

MB8014 Innovation and Technology Management
This course prepares students to manage in turbulent, high technology environments characterized by digital transformation of industries. Students will critically evaluate questions about innovation, such as: What is innovation? How does it unfold? How do organizational structures enable and constrain innovation? What would a manager need to know in order to effectively manage innovation? What types of competitive dynamics emerge in industries experiencing significant innovations? How do management fads affect innovation? How does the larger context of society affect innovation? Students will learn how ways of structuring and managing organizations can foster or stifle innovation. 1 Credit. *Anti-requisite MT8216 or MT8212

MB8015 Business Analytics for Managers
This course introduces basic data science techniques of Business Analytics in support of evidence-based management. The objective of the course is to help students develop competence for formulating and analyzing business problems, and interpreting the results of data analysis using various business analytics software tools. The course follows an outcomes based action learning approach that entails intensive hands-on problem solving with software tools [such as EXCEL Analytics Platform]. The primary focus is on developing competence for applying business analytics techniques for strategic decision making, and improving organizational performance and innovation capabilities. Effective communication is a significant dimension of business analytics work. Students will be expected to construct evidence based arguments for short business cases in order to present the analytics results in a manner appropriate for management consumption. 1 Credit. *Antirequisite MT8312

MB8016 Capstone Project – Consulting Project
Students, working in teams under the general guidance of a faculty member, will execute a consulting project for a real client. The project will address a significant problem faced by the client and will allow the students to interact with the client organization to investigate the problem and develop possible solutions. The student team will be responsible for all aspects of the client relationship, with a faculty member acting as adviser and observer. The aim is to challenge the students to disrupt the marketplace and provide the organization with actionable, innovative ideas. This capstone project offers students options to integrate knowledge gained from prior courses and experiential activities, based on their career interests

MB8017 Capstone Project – Entrepreneurial Project
Based on a selection process, students will have the opportunity to develop a plan to start up a business or further develop an existing start-up. Throughout the course, successful entrepreneurs and venture capitalists from the Ryerson ecosystem, will be available to provide useful perspectives on their startup experiences. Students will have the opportunity to apply to Zones within the DMZ. Each zone has a distinct focus that provides opportunities to shape initiatives from the ground up and gain experience that prepares students for the real world. Pass/Fail

MB8018 Capstone Project – International or Canadian Experience
Students gain an understanding of a specific cultural, business, political, and economic environment impacting businesses. Students will meet with business executives and with community stakeholders. Under the guidance of a faculty member, students will work with a community group or business to transfer knowledge or solve a problem. Students will attend pre-travel training and bootcamp sessions prior to departing to select destinations. In the host countries/communities, students will gain first-hand experience and an understanding of a unique business culture directly from industry experts. Students will visit local companies and participate in cultural activities. Pass/Fail

MB8019 Financial Management
Building on the foundations in Accounting and Finance, this course further develops an understanding of the challenges for sound financial planning and management in a global environment. Students learn the risk return characteristics of various international financial markets and financial instruments. Topics include financial instrument valuation (stocks, bonds and derivative securities), going public decisions, initial and seasonal equity offerings, joint venture, venture capital firms and international entry decisions. Antirequisites: MB8109, MT8109 1 Credit

MB8110 Integrating AI: Business Process Management Perspective
Artificial intelligence (AI) is fast growing and has been increasingly applied to improve business process performance. This course aims to equip students with fundamental knowledge of AI and concepts and techniques in business process analysis and design through hands-on exercise and guest lectures who are AI practitioners. Students will learn commonly used notation Business process management notation (BPMN) to capture business processes and easy-to-use tools for diagramming and analyzing business processes. The course is practical in nature, so students shall be able to apply the course content to their work. Ultimately, students are expected to develop a deeper understanding of how AI could be applied to facilitate, not to replace, human beings for better process performance. 0.5 Credits.

MB8111 Negotiation and Conflict
The primary objective of this course is to help students develop the sophistication to analyze bargaining and conflict relationships and to learn (through class discussion, bargaining simulations and self-assessment) about their own individual bargaining style. The course explores the process of collective bargaining as it is currently practiced by organizations and their unions, as well as the major concepts and theories of the psychology of bargaining and negotiation that this process embraces. 0.5 Credits.

MB8112 Predictive Analytics for MBAs
This course introduces MBA students to the fundamentals of predictive analytics to leverage extensive proprietary data resources held by firms and businesses of all sizes. The past two decades have witnessed a massive growth in data sets. However, businesses lack the expertise needed to leverage their vast data resources. Thus, businesses are data-rich, but insights poor. This course equips the MBA students with the fundamentals of predictive analytics with time series and cross-section data. 0.5 Credits.

MB8113 Dynamic Decision Making and Problem Solving
Effective decision-makers are those who consistently identify and choose the best option among multiple alternatives. Their decisions are strategic, creative, reasoned, and defensible. This course is designed to introduce students to the fundamentals and principals of decision-making and integrative thinking in a dynamic and competitive business environment. It will expose students to theories of thinking, judgment and decision-making, creativity, learning from feedback, and causal reasoning. 0.5 Credits.

MB8114 Organizational Decision Making
Organizational decision-making involves vision, passion, the ability to make decisions under pressure and uncertainty, and the ability to motivate others toward one's vision. Dive into complex managerial issues with this course. Students will begin to gain insight into the perspective of a senior manager or leader and to understand the larger context of management. Through experiential exercises and detailed feedback from your peers and the professor, you'll enhance your decision-making. Students will focus on developing managerial skills, including managing in a global context. 0.5 Credits.

MB8115 Fundamentals of Data Science for Management
This course introduces basic data science techniques for evidence-based management. The objective of the course is to help students develop competence for formulating and analyzing business problems, and interpreting the results of data analysis using various business analytics software tools. The course follows an outcomes based action learning approach that entails intensive hands-on problem solving with software tools. The primary focus is on developing competence for applying basic data science models for strategic decision making, and improving organizational performance and innovation capabilities. Effective communication is a significant dimension of business analytics work. Students will be expected to construct evidence based arguments for short business cases in order to present the analytics results in a manner appropriate for management consumption. 0.5 Credits.

MB8116 Acquiring Consulting Skills & Processes
This course will examine consulting process models and their application, and help students develop specific skills to assist in their consulting careers. Students will study real life consulting projects with practitioners in order to explore consulting skills, roles, skills and services. 0.5 Credits.

MB8117 Project Management
This course focuses on both the science of project management and the art of managing projects. While exploring common theoretical methods and reviewing the content of the Project Management Book of Knowledge (PMBOK), the major course objective is to provide a comprehensive, integrated understanding of the effective project management process with particular emphasis on its application to real-world business and technology projects. The course will cover project, program and portfolio management concepts enabling students to understand the role of sponsors, managers and experts in the project management process. Antirequisite: MT8220 0.5 Credits.

MB8118 Brand Management
This course examines product and service innovation in media industries and investigates trends in consumption of media products and services. It introduces students to ways of understanding consumer behaviour with respect to media products and services. The course examines methods and models that treat consumers as customers, users, and audience members. Antirequisite: MB8402 0.5 Credits.

MB8119 Cases in Corporate Finance
This course is designed to provide students with a real life, integrated, experience in Advance Corporate Finance topics such as corporate valuation and governance, M&A, and corporate restructuring. Real life cases are used, along with a variety of others in order to give students the chance to develop their skills with respect to real life cases. 0.5 Credits.

MB8120 Data Science for MBAs
This course introduces MBA students to the fundamentals of data science to leverage extensive proprietary data resources held by firms and businesses of all sizes. The past two decades have witnessed a massive growth in data sets. However, businesses lack the expertise needed to leverage their vast data resources. Thus, businesses are data-rich, but insights poor. This course equips the MBA students with the fundamental knowledge of data science needed to manage, manipulate, and organize datasets. 0.5 Credits.

MB8121 Disruptive Digital Transformation
This course provides a holistic business view of disruptive digital transformation, with the perspectives of strategy, technology, and transformative change for individuals, the organization and society. Disruptive strategies dominate the business landscape. Powered by digital technologies, new start-ups and established organizations are rapidly creating innovative business opportunities and are challenging traditional business models. Canadian businesses compete with each other locally but the true threat comes from competitors that create global impact using disruptive technologies. Uber threatens local taxi firms, Netflix challenges Canadian cable companies, and Canadian banks now see Apple as a non-traditional financial service rivals. Indeed, Facebook or Bitcoin may displace sovereign currencies. 0.5 Credits.

MB8122 International Finance
Financial theory will be applied to a variety of international finance issues including interest rates, exchange rates, corporate valuation, securities valuation, risk management, and foreign currency derivatives. Practical solutions to real world financial issues will be explored. Students will learn how to evaluate the financial position of a corporation or a trader through examination of portfolio composition, how to analyze financing and investment problems using discounted cash flow framework, how to evaluate the impact

of different financing and investment decisions on the multinational corporations' shareholders' wealth, and how various interest rand foreign exchange rates are formed. Upon completion of this course, students will be able to name and discuss the issues in international finance and will be able to demonstrate this knowledge by being able to evaluate possible outcomes for various courses of financing and trading actions. 0.5 Credits.

MB8123 Professional Sales
This course in professional selling focuses on the advanced study of the sales process including relationship and account management, negotiation, team selling, sales leadership, and sales technology. It will use active learning methods to gain professional sales experience through practice and applied learning. This will be accomplished through a combination of business case class discussion, sales training from experts in the field, and role-play opportunities. Professional selling is an essential component of the promotion or communication mix. You will gain practical influencing and professional selling skills that you can use in any field of business. 0.5 Credits.

MB8124 Social Media Analytics
This course will help students develop a deeper understanding of social media and big data analytics techniques and platforms. Specifically, students will learn how to derive actionable business intelligence from publicly available social media data sets; while following privacy and ethical frameworks of working with user-generated data. Student will also learn how to select the appropriate KPIs and measurement tools to support strategic decision making and improve organizational performance. The course will feature a number of hands-on, experiential learning exercises using commonly available business analytics software tools throughout the term. Antirequisite: MT8313 0.5 Credits.

MB8125 Developing Your Startup
This experientially based course will empower students to use 21st century entrepreneurship techniques to work on their own business idea. This course focuses on the practical aspects of the start-up and management of a new venture. Students will be exposed, through in-class exercises, to various modern tools used to build their new venture. Students will undertake a major field exercise with early adopters to investigate product fit and likely business models. The fieldwork is finalized in the classroom through facilitated peer discussion. 0.5 Credits.

MB8126 Talent Management
Companies often describe the people they employ as their most important asset. The best companies view talent as a competitive differentiator and a key area where the acquisition, engagement, development, and retention of talent is a strategic priority. Talent management involves individual and organizational development in response to a changing and complex operating environment. It is not just limited to attracting the best people from the industry but also a continuous process that involves sourcing, hiring, developing, retaining and promoting them while meeting the organization's requirements simultaneously. 0.5 Credits.

MB8127 Investment and Portfolio Management
The objective of the course is to understand the fundamental theory and the characteristics of stock, bond and derivative securities. The course will also teach how to apply the knowledge of the securities in portfolio management. It will cover analysis of equity, fixed income, derivative and alternative investments. In the second half of the course, portfolio management will be covered. After completing the course, students will be able to answer investments, equity, fixed income, derivatives and portfolio management part questions of CFA first level questions successfully. 0.5 Credits.

MB8128 Starting Your Startup
This foundation module is designed to stimulate the student's interest in entrepreneurship. By means of case studies, articles, videos and presentations, students will begin by learning from prominent entrepreneurs who have demonstrated commitment, passion, risk-taking, strategic thinking and implementation, with the ability to develop core competencies as they create and grow their successful enterprises. Building on these case stories, students will gain a foundation of the theories behind successful entrepreneurship activities and begin an experiential journey into the early stages of starting a new venture and discover the issues and responsibilities facing a new business owner. Whether or not students actually start a business on their own, they will develop an appreciation for the challenges facing the entrepreneur. 0.5 Credits.

MB8129 Understanding Consultants & Consulting
Management consulting is a major service industry. This course will examine the nature of consulting work, firm structure and the services that are provided, as well as the ways in which consultants and clients work together successfully. Both the theory and the practice of consulting will be addressed. This course will be relevant to students who anticipate being external or internal consultants and includes elements of self-assessment and career planning. 0.5 Credits.

MB8130 Strategic HRM
This course develops competencies in managing a global workforce. Specific topics include the behavioural impact of cultural differences, alternative approaches to organizational structure, cross cultural communication challenges, management of diverse groups, leadership and employee motivation techniques for global managers, and conflict resolution across cultures. Students will assess their own managerial and leadership competencies and develop a personal plan for skill development. A key component of this course is the online Human Resources Management (HRM) simulation. The HRM simulation is an on-line competitive simulation where students take on the role of Human Resource Director for a growing organization. 0.5 Credits.

MB8131 Sourcing Digital Services
In 1990s and 2000s, industry coined the term IT Outsourcing, often with services delivered from offshore locations. With the advent of cloud services and related digital technologies, the global outsourcing market of $85 billion has evolved from outsourcing assets such as data centres, servers and software, to a model where organizations acquire digital services as needed. This program prepares students who will be buyers of these services. Often, the services are delivered by some of the largest organizations in the world, such as Amazon, Apple, IBM and Microsoft. A well-educated buyer can begin to understand and manage the sourcing process with the knowledge from this course. 0.5 Credits.

MB8132 Causality and Causal Inference Methods
Most business analytics (BA) courses focus on teaching analytical methods that identify correlations, classes, and associations among relevant variables, when the ultimate goal of BA is actually to identify cause-and-effect relationships, in order to design the appropriate policies, strategies and business plans. This course provides an introduction to the body of knowledge on causality and causal inference that has emerged during the last 3 to 4 decades. The course material builds up on the core BA course. It aims to provide students with: 1) an in-depth conceptual understanding of the challenges and issues around the identification of cause-and-effect relationships, as well as 2) the technical aspects, algorithms and tools to carry out causal analyses. 0.5 Credits.

MB8133 Personal Finance
The objective of this course is to introduce students to the subject of personal financial decision making. We will explore the role of the individual decision maker and the role of the financial advisor. Major areas covered by the course are budgeting, tax planning, financing, protecting your assets and income, investments, retirement, and estate planning. Students will learn how logic and emotions affect personal financial decisions. After taking this course, students will have learned the tools and activities that will help manage their own money, and manage money for other individuals and families. 0.5 Credits.

MB8134 Mental Health and Wellbeing in the Workplace
The focus of this (half credit) course is on how to flourish in the workplace. It is based on Positive Psychology, which is a field of study that encompasses six broad areas of research: positive emotions, engagement, relationships, meaning, achievement, and vitality (PERMA-V). Resilience, as a foundation to flourishing, will be explored and resilience skills and strategies will be taught. 0.5 Credits.

MB8135 Sport Business Strategy
This special topics course will focus on fundamentals of both sport business-level and corporate-level strategy. The course is designed to introduce a wide variety of modern sport strategy frameworks and methodologies, including methods for assessing the strength of competition, for understanding relative bargaining power, for anticipating competitors' actions, for analyzing cost and value structures and their relevance to competition, and for assessing potential changes in the scope of the firm. A sport business strategy consulting project will be the final capstone group project for this course. 0.5 Credits.

MB8136 Sport Business Marketing
This course is designed to discuss the fundamental management and marketing problems for the sport business industry. The main objective of this course is to a) develop an understanding of the tools and scope that are used to drive leading sport business marketing strategy and relationships within the broader sport marketing industry. In addition, this course will address the variety of contemporary problems and opportunities that confront sport business marketers. 0.5 Credits.

MB8137 Pop-up Topics in Management
This course provides students with the opportunity to pursue advanced studies on interdisciplinary issues and themes of emerging and current significance in Management. It allows students to access leading-edge research and to explore new and emerging theories and models of practice. The particular theme, topic, and structure of the course may vary in response to changes and trends in the field, availability of specialists, and student interest. 0.5 Credits.

MB8138 Directed Reading
This course gives students space to study literature that explores the full theoretical and contemporary scope of readings pertaining to a topic of interest. Under the guidance of the professor, the student will select a topic and investigate the area of specialization. The course will involve the exploration of the literature in a particular area guided by a member of the faculty with whom the student will meet regularly to discuss the readings. Students must seek out the approval of the MBA Program Director and faculty instructor prior to enrolling in this course. 0.5 Credits.

Course Listing (PMDip)

MT8212 Innovation and Org Theory
This course prepares students to manage in turbulent, high technology environments. Students are introduced to theories of innovation, and learn how various ways of organizing and managing people and work can foster or stifle innovation. Students will apply models of innovation and diffusion to analyze industry trends and identify and assess strategic options for individual firms operating in environments of rapid technological change. Antirequisite: MT8201 and MT8203. 1 Credit

MT8213 Technology and Org Strategy
This course examines how strategic leaders transform and position their organizations to exploit technological change for competitive advantage. It provides an understanding of the issues surrounding the formulation and implementation of technology-based strategies, and explores frameworks for managing in a technology-based economy. Antirequisite: MT8202. 1 Credit

MT8216 Global Markets and Tech Trends
This course explores emerging issues (technologies, trends, geopolitical policies etc.) with an emphasis on their potential impact on global enterprise practices. The course also focuses on developing planning models to incorporate environmental scanning and technology forecasting as components of effective strategic planning models. Antirequisite: MT8211. 1 Credit

MT8911 Technical Foundation for Mgrs.
Information security is a broadly encompassing field focused on the protection of data assets and intangible intectual property of all kinds. (Data) privacy relies on information security as a necessary, but not sufficient condition to ensure that the legal and moral rights of data owners are respected. Both security and privacy are enabled by IT operations and controls, which again are necessary, but not sufficient conditions to ensure that security and privacy "work". 1 Credit

MT8912 Mnging for Max Benefit and Effect
This course represents the capstone of the certificate program. While topics of special interest will be presented throughout the semester, the main thrust of the course will be completion of major term group projects intended to address specific issues/problems in security and privacy management identified at one of a number of "volunteer" companies or organizations agreeing to participate in this Ryerson initiative. 1 Credit

MT8913 Sec and Prvcy Mgmt Fundamentals
Mgmt of highly technical areas, such as scientific research, engineering, information security and data privacy often presents difficult challenges well beyond the realm of mainstream financial or operational management. In part, this arises because management may be insufficiently versed in the underlying subject matter to make informed decisions. 1 Credit

MT8914 Law, Cmplce, Aud and Cert, Comp Crime
This course provides students with broad exposure to topics which affect the management of corporate information security and privacy, but are not directly part of it. It also provides them with the ability to extrapolate requirements and risks, based on an understanding of the underlying legal, social and compliance drivers. 1 Credit

MT8916 Advanced Financial Accounting
This course will develop the student's ability to integrate issues across different technical and Enabling competencies and develop a higher level of problem solving and decision making skills. Throughout the course, students will be expected to display the attitudes, behavior and ethics incorporated in the CPA mindset. The course is grounded in Financial Accounting and Financial Reporting processes and covers both routine and non- routine transactions and disclosures, at the highest level expected in the CPA competency map. Multi subject cases will be used to develop the students' ability to integrate issues across functional areas including Assurance, Finance, and Performance Management and Tax. Emphasis must be on stakeholders' need and their potentially conflicting interests. Issues in, public, private and not for profit enterprises in a multi GAAP framework will be covered. 1 Credit

MT8917 Management Accounting
This course will provide integration of key areas in Management Accounting into strategy, business operations and planning. The main delivery method is an immersive case based on a currently active business that has gone through phases of growth and acquisition since its founding in 2000. Students will be required to utilize their knowledge gained in their undergraduate courses and personal experiences. They will be expected to analyze the company at various phases in its growth and communicate key recommendations as to future courses of action through these phases. The immersive case will place the students in roles that are exactly matched to the positioning of a CPA in today's professional environment. Two large corporation cases will also be utilized in a narrower context to ensure that the students are adequately exposed to a 'big business' setting, rather than the start-up company being explored in the immersive case. For a class by class description of the course and its mapping to the CPA competencies, please see the table presented on pages 5 through 8. 1 Credit

MT8918 Advanced Auditing an Assurance
This course builds on the knowledge of auditing obtained in earlier courses by focusing on application of professional judgment in audits for various types of businesses and industries, such as decisions related to independence, governance, materiality, fraud risk, control evaluation, complex estimates, uncertainties, and audit opinions. Other topics include: professional standards, assurance engagements related to financial information and other information such as GHG emissions, auditor roles in organizations and government such as internal, forensic and comprehensive auditing, and assurance related to securities regulations such as offering documents, forecasts and due diligence. A key aspect is analysis of practice- based external and internal auditing simulations that integrate assurance issues with accounting, management, taxation, and finance considerations. The course will equip the students with the competencies to perform audits from assessing the need for an engagement or project to developing and performing procedures. 1 Credit

MT8919 Advanced Finance
This course is designed to help students develop the competencies expected in advanced finance topics. The course begins with a review of financial statement analysis and planning before exploring other key finance topics including treasury management, capital budgeting, valuation methodologies, financial risk management, and corporate finance transactions. It involves in-depth case analysis and cross-competency integration. 1 Credit

MT8920 Accounting Taxation Integration
The first part of the course will further develop the tax knowledge and identification of tax issue skills through the use of complex cases to simulate real world experience. Emphasis in the second part of the course will be on developing the skills to approach a multi subject case**.** Emphasis in the cases will be on identifying the stated and implied issues, analyzing each issue and making sound ethical recommendations, while considering the impacts on all stakeholders. The course content will take into account both the specific taxation competencies and the enabling competencies of ethical behaviour, decision-making, problem-solving, communication, and leadership required in the professional accounting field. Effective individual communication, both orally and in writing, will be essential to demonstrating mastery of the course objectives. This is a capstone course requiring preparation for each class so that each student is ready to contribute to the class discussion and case presentations. 1 Credit

MT8931 Corporate & Nonprofit Governance
This course provides a context for social enterprise within the Anglo--American sphere of capital markets--focused finance. It also provides a survey of non--profit governance mechanisms. This context is related to the development of new methods of financing social enterprise. Through the legal structures and actors that have brought market-- oriented logics into financing and assessing the performance of social enterprise. It will acquaint students with the impact of government policy and market structure on the role of the capital markets in supporting a wide range of enterprises. This material will provide perspective on the history of Canadian capital markets, their objectives, and the actors that affect them, such as pension funds, banks, exchanges, public policy makers, and

corporations themselves, many of which may have an interest in financing social enterprise. Students will gain perspective on the institutions that govern capital markets within the developed countries that make up the Anglo American sphere of capital markets--focused finance, as well as an international survey of the conventional capital markets and how their integration creates opportunities and challenges for financing social enterprise. It will acquaint students with the impact of government policy and market structure on the role of the capital markets in supporting a wide range of enterprises, those with social agendas. 1 Credit

MT8932 Alternative Perspectives on Finance:
This course will provide context on approaches to finance from the behavioural finance perspective, as well an international survey of systems of finance outside the Anglo American sphere. Because social enterprise occurs in a variety of settings, with different systems of finance, perspectives on systems such as Islamic Finance, or State oriented finance, and the systems a variety of post-colonial, developing countries, where many social enterprises are situated. 1 Credit

MT8933 Investing for Impact
This course is an industry-focused course on both impact investing in social enterprise as part of portfolio of investments, and on bottom of the pyramid finance such as micro---finance. Impact investing aims to create positive social and/or environmental impact, alongside financial returns. With the proliferation of new players, approaches, financial instruments and evaluation tools, the field of impact investing has significantly progressed in recent years to tackle an array of social issues. It will also cover instruments like Social Impact Bonds designed for specific projects and crowdfunding. The course is designed to be an introduction to impact investing: how the industry has emerged, why it is gaining prominence, and where it is going. It will explore its roots in micro---finance, its influence on business and philanthropy, as well as the opportunities and challenges ahead. 1 Credit

MT8934 Financing and Assessing Social Impact:
This course is built assessments of social enterprise and returns on social investments. This piece will be most valuable for professionals working in social enterprise, but will also inform the investor on how these instruments work to produce desired outcomes. Impact Analysis includes a detailed measurement of social enterprise outcomes, and analyzing individual organizations will form a key deliverable for this course. There are also established metrics, such as the Progress out of Poverty Index, some of which have been developed from environmental impact metrics, and metrics for measuring corporate social responsibility, as well as an active scholarly literature on impact assessment. Students will gain a perspective on the history and best practice in social impact assessment, and how it is linked to financial instruments. 1 Credit

MT8935 Capstone Project in Finance for Social Innovation
A Capstone Project will be completed after coursework, and will be created as a course taught by a single instructor. The projects will use archival data, policy analysis and interviews with industry professionals. The capstone project will consist of a paper completed using archival data or policy analysis on a topic related to financing social innovation. The workload will be the equivalent of a readings course. 1 Credit

MT8940 Fixed Income Securities
MT8941 Advanced Portfolio Management
MT8942 Advanced Investment Management
MT8943 Derivatives
MT8944 International Finance

MT8945 Executive Leadership for CIOS
This course provides advanced leadership skills for IT executives by pairing leadership theory with practical techniques and both individual and group-level interpersonal skills for leaders. Through an application of current leadership theory to practice, students will gain a better understanding of how leaders shape organizational experiences and outcomes, with a particular focus on the challenges faced by those in executive leadership roles. (1 credit)

MT8946 Capstone – MTI for CIOs
The Capstone Project will consist of a paper completed by each participant on a topic relevant to their workplace and aligned with the PM Diploma MTI. It will be graded on a Pass / Fail basis, and will build on topics discussed in the taught courses and will demonstrate written English proficiency. The Capstone Project will be completed after coursework and will be created as a course taught by a single instructor. Pass/Fail

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Master of Engineering Innovation and Entrepreneurship

CURRICULUM

Master of Engineering Innovation and Entrepreneurship

DEGREE REQUIREMENTS		Credits
EI8004	Finding Validating Bus Opp	1
EI8005	Market Dev Fin Plan Start-Up	1
EI8006	New Venture Bus Strat Plan	1
EI8007	Lean Start Up Disc Practicum	1
EI8008	Lean Start Up Valid Practicum	1
EI8009	Lean Start Up Acq. Practicum	1
EI8010	Startup Feasibility Project	1
EI8011	The Commercialization Project	1
Two Engineering track Elective credits.		2

ELECTIVES		
EI8001	Healthcare and Medtech Innovation	1
EI8002	Energy Innov. Entrepreneurship	1
EI8003	Sustainable Entrepreneurship	1
BE8001	Foundations of Biomedical Eng	1
BE8002	Seminars in Biomedical Eng	1
BE8003	Directed Studies	1
CP8202	Advanced Software Engineering	1
DG8001	Foundations of Digital Media	1
DG8003	Interaction Design Digital Media	1
DG8004	Digital Media Entrepreneurship	1
DG8112	Physical Computing	1
ME8118	Info Sys Analysis & Design	1
MT8310	Special Topics Info Sys Mgmt	1
SA8901	Geospatial Data Analytics	1
DS8001	Des Algorithms and Programming	1
DS8003	Mgt of Big Data and Tools	1
DS8004	Data Mining and Presc Analytics	1

COURSE LISTING

EI8001 Healthcare and Medtech Innovation
This course is designed to provide would-be entrepreneurs with the context and tools to seek venture capital investment in healthcare start-up businesses and to better understand the unique model of this sector and the specific challenges that one might expect. The focus will be on biotechnology and also include information on medical technologies as well as the emerging field of healthcare IT, particularly as they differ from biotech. 1 Credit

EI8002 Energy Innovation & Entrepreneurship
We will explore drivers for innovation in Ontario's energy sector, the opportunities for new business, and the challenges of moving from the idea stage to the marketplace. Barriers and bridges to innovation and commercialization technological, financial, and regulatory will be explored through case studies, including lessons learned from guest lectures by business leaders in the Ontario energy sector. 1 Credit

EI8003 Sustainable Entrepreneurship
Introduce the closed-loop economy and the cradle-to-cradle framework of eco-effectiveness. Introduce the unifying governance corporate structure of the Benefit Corporation (B-Corp). Introduce within a unified framework of a sustainable enterprise, the basic tools of new "business" development, e.g. market research, stakeholder analysis, business model, etc. to formulate a concept initiation proposal and solution development plan. 1 Credit

EI8004 Finding & Validating Bus Opp New Venture
Introduction to entrepreneurial processes and behaviour. Enables the student to distinguish between ideas and business value creation. Facilitates students finding and validating business opportunities for new venture. Teach how to conduct market research and intellectual property assessment for the development of their technology based business idea. Uses the market research data and intellectual property to determine the source of their sustained competitive advantage. 1 Credit

EI8005 Market Dev & Fin Plan for Start-Up
Introduction to the 5 steps market development and testing and the 7 market research tools for the student to apply on their business idea. Understanding the financial dimension of new venture; understanding the nature of capital investment and role of banks and VC industry; understanding business and managerial accounting; appreciating operational and resource issues; understanding project management and how the innovation process may be managed. Prerequisite: EI8004 1 Credit

EI8006 New Venture Business Strategy & Plan
This course covers the fundamentals of "taking the opportunity to the next level" which depend on the entrepreneur's ability to communicate the opportunity concisely, in a way that will convince investors that the risk of investment is worth it. The lectures in this course will follow a process-based approach, in which students develop their ideas into business plans. The importance of writing an effective and concise business plan, as a foundation for the start-up cannot be underestimated. Prerequisite: EI8004 and EI8005 1 Credit

EI8007 Lean Start Up Cust. Disc. Practicum
Facilitates students refining their value proposition for the business idea they want to pursue. Assist in developing customer's interview script to conduct detailed testing of customer problems and product solution assumptions. Through primary market research the students will validate the product market fit for their new venture. Through market research with real customers the students will iteratively refine their business model canvas. Prerequisite: EI8004 Credit

EI8008 Lean Start Up Cust. Validation Practicum
This practicum will enable the students to shape the technology solution to be disruptive or sustainable market innovation. Facilitate the creation of technology proof-of-concept plan and the technology development processes to identify and assemble the key technical components. Facilitate testing of a proof-of-concept with lead customers to validate market product fit. Prerequisite: EI8005 and EI8007 1 Credit

EI8009 Lean Start Up Cust. Acquisition Practicum
This practicum covers the fundamentals of "taking the technology solution" to market which depend on the entrepreneur's ability to communicate the value proposition concisely, in a way that will convince customers (client) to want to acquire it. The lectures in this course will follow sales process-based approach, in which students develop their client sales proposal. The importance of writing an effective and concise sales plan, as a foundation for the go-to-market cannot be underestimated. Prerequisite: EI8008 1 Credit

EI8010 Startup Feasibility Project
The supervised project is a major component of the MEIE program and work on the project commences at the start of the academic program and continues throughout the remaining duration of the program. In teams, students are expected to apply the tools and skills from the related to finding and evaluating technology-based business ideas, building a team that can seize the opportunity and deciding the technical and business feasibility of the business opportunity.
Prerequisite: EI8005 and EI8006 Corequisites: EI8004 and EI8005 1 Credit

EI8011 The Commercialization Project
The supervised project is a major component of the MEIE program. The work on the project commences at the start of the third term of the academic program and continues for the remaining of the program. Working with mentors from the iBoost zone, the students will spend a substantial amount of their time working on their project at the iBoost Zone or other Ryerson Zones. Prerequisite: EI8005 and EI8006 Corequisites: EI8006 and EI8009 1 Credit

For course descriptions of non EI courses, go to the Program offering the course. BE – Biomedical Engineering CP – Computer Science DG – Digital Media DS – Data Science and Analytics ME – Mechanical and Industrial Engineering MT – Master of Science in Management SA – Spatial Analysis

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MASTER OF SCIENCE IN MANAGEMENT

CURRICULUM

Master of Science in Management

DEGREE REQUIREMENTS		Credits
Master's Thesis		(Milestone)
SM8000	Research Seminar	pass/fail
SM8103	Applied Research Methods I	1
SM8104	Applied Research Methods II	1
Four Elective credits		4

ELECTIVES		Credits
SM8700	Directed Reading: Accounting	1
SM8701	Directed Reading: Bus Tech Mgmt	1
SM8702	Directed Reading: Econ & Mgmt Sci	1
SM8703	Directed Reading: Finance	1
SM8704	Directed Reading: Entrp & Strategy	1
SM8705	Directed Reading: Glbl Mgmt Studies	1
SM8706	Directed Reading: Health Serv Mgmt	1
SM8708	Directed Reading: Hosp Tourism Mgmt	1
SM8709	Directed Reading: HR Mgmt & Org Beh	1
SM8710	Directed Reading: Law & Business	1
SM8711	Directed Reading: Marketing Mgmt	1
SM8712	Directed Reading: Real Estate Mgmt	1
SM8713	Directed Reading: Retail Mgmt	1
SM8722	Special Topics	1
SM8723	Advanced Data Analytics in Business	1
SM8901	Directed Readings	1

With Program approval, selected electives from the MBA program and courses from the PhD in Management.

COURSE LISTING

SM8000 Research Seminar
Pass/Fail

SM8103 Applied Research Methods I
Students are introduced to quantitative and qualitative research techniques, with particular emphasis on their application to the field of management. Antirequisite: MT8101, MT8102. 1 Credit

SM8104 Applied Research Methods II
This course is a continuation of SM8103. In this course, students will refine their research question, develop expertise in the specific methodology to be used for their thesis research, and will develop a research proposal. 1 Credit

SM8700 Directed Reading: Accounting
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Accounting, while working with a faculty supervisor. 1 Credit

SM8701 Directed Reading: Bus Tech Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Business Technology Management, while working with a faculty supervisor. 1 Credit

SM8702 Directed Reading: Econ & Mgmt Sci
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Economics and Management Science, while working with a faculty supervisor. 1 Credit

SM8703 Directed Reading: Finance
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Finance, while working with a faculty supervisor. 1 Credit

SM8704 Directed Reading: Entrp & Strategy
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Entrepreneurship & Strategy, while working with a faculty supervisor. 1 Credit

SM8705 Directed Reading: Glbl Mgmt Studies
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Global Management Studies, while working with a faculty supervisor. 1 Credit

SM8706 Directed Reading: Health Serv Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Health Services Management, while working with a faculty supervisor. 1 Credit

SM8707 Directed Reading: Health Info Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Health Information Management, while working with a faculty supervisor. 1 Credit

SM8708 Directed Reading: Hosp Tourism Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Hospitality and Tourism Management, while working with a faculty supervisor. 1 Credit

SM8709 Directed Reading: HR Mgmt & Org Beh
This course is intended to permit the student to survey a coherent body of literature in an area of study related to HR Management and Organizational Behaviour, while working with a faculty supervisor. 1 Credit

SM8710 Directed Reading: Law & Business
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Law & Business, while working with a faculty supervisor. 1 Credit

SM8711 Directed Reading: Marketing Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Marketing Management, while working with a faculty supervisor. 1 Credit

SM8712 Directed Reading: Real Estate Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Real Estate Management, while working with a faculty supervisor. 1 Credit

SM8713 Directed Reading: Retail Mgmt
This course is intended to permit the student to survey a coherent body of literature in an area of study related to Retail Management, while working with a faculty supervisor. 1 Credit

SM8722 Special Topics
This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The particular course description will be announced prior to scheduling the course.

SM8723 Advanced Data Analytics in Business
This course prepares graduate students in business and management to determine how changes in policy or strategy affect outcomes. Relying on the basic Regression model, this hands-on course prepares students to define the research question, identify a counterfactual, estimate the empirical model, and make inferences about the efficacy of the strategy/policy. 1 Credit

SM8901 Directed Readings
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's field of study. 1 Credit

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MATHEMATICS

CURRICULUM

Master of Science in Applied Mathematics

DEGREE REQUIREMENTS		**Credits**
AM8000	Master's Seminar	Pass/Fail
AM8101	Principles and Techniques	1
AM8102	Advanced Numerical Analysis	1
One Foundation course		1

AND one of the following Options:

Thesis Option

	Master's Thesis	Milestone
	Two electives from the Electives list or the remaining Foundation course	2

Major Research Paper Option

	Major Research Paper	Milestone
	Four electives from the Electives list or the remaining Foundation course or other approved graduate courses	4

Doctor of Philosophy in Mathematical Modelling and Methods

DEGREE REQUIREMENTS		
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
AM9000	PhD Seminar	Pass/Fail
3 Electives		3

Foundation Courses		**Credits**
AM8001	Analysis and Probability	1
AM8002	Discrete Mathematics and its Applications	1

Electives		**Credits**
AM8201	Financial Mathematics	1
AM8204	Topics in Discrete Mathematics	1
AM8205	Applied Statistical Methods	1
AM8206	Partial Differential Equations	1
AM8207	Topics in Biomathematics	1
AM8208	Topics in Mathematics	1
AM8209	Directed Studies in Math	1
AM8210	Mathematical Biology	1
AM8211	Non-Linear Programming and Applications	1
AM8212	Introduction to Fluid Dynamics	1
AM8213	Financial Mathematics II	1
AM8214	Computational Complexity	1
AM8215	Stochastic Processes	1
AM9000	PhD Seminar	1
AM9001	Advanced Topics in Discrete Mathematics	1
AM9002	Advanced Topics in Financial Mathematics	1
AM9003	Advanced Topics in Biomathematics and Fluids	1
AM9004	Dir. Studies Math Model/Method	1

COURSE LISTING

Candidacy Examination (Doctoral)
This is a "Milestone". Pass/Fail

Doctoral Dissertation
This is a "Milestone". Pass/Fail

Master's Thesis
This is a "Milestone." Pass/Fail

Major Research Paper
This is a "Milestone." Pass/Fail

AM8000 Master's Seminar
The course consists of regular research seminars in the general area of applied mathematics, given by graduate students, faculty members, visiting scholars, and guest speakers. In order to pass this course, each student is normally expected to attend seminars during each term in the program, for a maximum of four terms, and to give one presentation. Pass/Fail.

AM8001 Analysis and Probability
Topics to be covered will be taken from the following list: metric spaces, Banach and Hilbert Spaces, measure spaces, integration, functional spaces and operators, random variables and conditional expectation; modes of convergence, discrete time martingales and filtrations; Brownian motion, continuous time stochastic processes and martingales; stochastic calculus. 1 Credit

AM8002 Discrete Mathematics and its Applications
Selected topics from discrete mathematics: graph isomorphisms and homomorphisms; Ramsey theory, random graphs; infinite graphs; automorphism groups; graph searching games (such as Cops and Robbers); Steiner triple systems; graph decompositions; Latin squares; finite fields; polynomial rings; finite projective and affine planes. 1 Credit

AM8101 Principles and Techniques in Applied Math
Asymptotic Expansions; Perturbation Methods; Eigenfunction Expansions; Integral Transforms; Discrete Fourier Transforms. 1 Credit

AM8102 Advanced Numerical Analysis
Numerical methods; numerical linear algebra; numerical methods for ODEs; numerical methods for PDEs. 1 Credit

AM8201 Financial Mathematics
This course covers the fundamentals of mathematical methods in finance. After providing a background in Stochastic Calculus, it considers the study of financial derivatives. Fixed income instruments, derivative pricing in discrete and continuous time, including Black-Scholes formulation, American and Exotic options are considered. Elements of Portfolio Management and Capital Asset Pricing Model are also taken into account. 1 Credit

AM8204 Topics in Discrete Mathematics
Selected advanced topics from discrete mathematics: random graphs; models of complex networks; homomorphisms and constraint satisfaction; adjacency properties; Ramsey theory; graph searching games; Latin squares; designs, coverings, arrays, and their applications. 1 Credit

AM8205 Applied Statistical Methods
This course covers a wide variety of statistical methods with application in medicine, engineering, and economics. Exploratory data analysis. Parametric probability distributions. Sampling and experimental designs. Estimation, confidence intervals and tests of hypothesis. Analysis of variance. Multiple regression analysis, tests for normality. Nonparametric statistics. Statistical analysis of time series; ARMA and GARCH processes. Practical techniques for the analysis of multivariate data; principal components, factor analysis. 1 Credit

AM8206 Partial Differential Equations
Topics to be covered will be taken from the following list: Derivation of equations from conservation laws; First-order Equations and the Method of Characteristics; Weak Solutions; Hyperbolic Systems; Diffusion and Reaction-Diffusion Equations; Traveling Wave Solutions; Elliptic Equations. 1 Credit

AM8207 Topics in Biomathematics
Discrete and continuous time processes applied to biology and chemistry. Deterministic and stochastic descriptions for birth/death processes in chemical kinetics. Numerical methods for spatially distributed systems including multi-species reaction-diffusion equations. Applications will include some or all of: chemical waves, traveling wave fronts in excitable media, spiral waves, pattern formation, blood flow and flow in chemical reactors. 1 Credit

AM8208 Topics in Mathematics
The topics in this course will vary each time it is offered as it will depend on the professor teaching it and the topics that interest the students. 1 Credit

AM8209 Directed Studies in Mathematics
This course is for students who wish to gain knowledge in a specific area for which no graduate level classes are available. Students who are approved to take the course are assigned a suitable class advisor most familiar with the proposed content. Students are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized format. 1 Credit

AM8210 Mathematical Biology
Linear and nonlinear differential equations, Routh-Hurwitz criteria, local stability, phase-plane analysis, bifurcations and global stability. Applications including some of predator-prey models, epidemic models, competition models and spruce budworm models. New journal research papers related to these models. 1 Credit

AM8211 Non-Linear Programming and Applications
Quadratic Optimization, Non-Linear Optimization, Optimality Conditions, Karush-Kuhn-Tucker Theorem, Numerical Methods (Descent Direction, Newton's), Portfolio Optimization, Markowitz Efficient Frontier, Capital Market Line, Sharpe Ratio. Antirequisite: MTH603

AM8212 Introduction to Fluid Dynamics
We derive equations governing fluid flows from the basic physical conservation laws. Exact analytic solutions to various elementary flow problems are obtained. We consider viscous flow, irrotational flow, boundary layers and water waves. Flow instability will also be examined. Mathematical results are related to phenomena observed in aerodynamics, flow through conduits and geophysical flows. Antirequisite: MTH732 1 Credit

AM8213 Financial Mathematics II
The course covers fixed income derivatives and the quantitative aspects of risk and portfolio management in modern finance. It introduces single factor interest rate models and pricing and covers analysis of risk measures and their properties, market, credit risk and an overview of other types of risks. The course also develops portfolio optimization techniques. Case studies and preparation for financial certification programs (FRM and PRM) are also included. Antirequisite: MTH800 1 Credit

AM8214 Computational Complexity
Order of Growth notation, time and space complexities of DTMs and NDTMs, intractability, basic complexity classes, P=NP?, reducibility and completeness, NP-completeness, Cook's theorem, hierarchy results, circuit complexity, probabilistic algorithms, models for parallel computation. Antirequisite: MTH814 1 Credit

AM8215 Stochastic Processes
This course provides a brief and broad introduction to various important stochastic processes that lie at the heart of stochastic analysis and modelling. Topics to be covered include Bernoulli processes, random walks, Poisson processes, Markov processes, Martingales, Brownian motions. 1 credit

AM9000: PhD Seminar
This course features presentations by guest speakers and PhD students. All students are required to attend and actively participate in seminars during each term in the program, for a maximum of six terms. Students will present two seminars, one of which will be on their dissertation, normally in their final year. This course aims to improve the communication skills of students. Pass/Fail.

AM9001 - Advanced Topics in Discrete Mathematics
A selection of topics from Discrete Mathematics: probabilistic method, random graph models such as binomial random graphs and random regular graphs; models of complex networks such as preferential attachment, ranking, geometric, and copying models; graph searching problems such as Cops and Robbers games, graph cleaning, and firefighting; designs, coverings, arrays, and their applications; homomorphisms and constraint satisfaction problems; combinatorial optimization problems on graphs and approximation algorithms. 1 Credit.

AM9002: Advanced Topics in Financial Mathematics
A selection of topics from the following topics in Financial Mathematics: Arbitrage pricing. Completeness and Hedging. The Martingale Approach to Arbitrage. Incomplete Markets. Exotic Derivatives. Interest Rate Models. Stochastic calculus for general semi-martingales. Levy processes. Advanced portfolio risk management. Dynamic risk measures. Advanced Credit Risk Models. 1 Credit.

AM9003: Advanced Topics in Biomathematics and Fluids
A selection of topics from Mathematical Biology and Fluid Dynamics: Review of basic fluid dynamics; hydrodynamic stability theory; mathematical modeling of blood ow and thin-film flows; biochemical networks; probability models; stochastic simulation; Markov processes; chemical and biochemical kinetics; The fixed point index, nonlinear eigenvalue problems, bifurcation, nonlinear elliptic boundary value problems; population models. 1 Credit.

AM9004 Dir. Studies Math Model/Method
This course is for PhD students who wish to gain knowledge in a specific area for which no graduate level classes are available. Students who are approved to take the course are assigned a suitable class advisor most familiar with the proposed content. Students are required to present the work of one term (not less than 90 hours in the form of directed research, tutorials and individual study) in an organized format. 1 Credit

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MECHANICAL AND INDUSTRIAL ENGINEERING

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS	Credits
Master's Research Seminar	(Milestone)
Master's Thesis	(Milestone)
Five Elective credits	5

Master of Engineering

DEGREE REQUIREMENTS	Credits
Master's Project*	(Milestone)
Eight Elective credits	8

*students may apply to substitute 2 courses for the project.

Doctor of Philosophy

DEGREE REQUIREMENTS	Credits
Doctoral Research Seminar	(Milestone)
Candidacy Examination	(Milestone)
Dissertation	(Milestone)
Four Elective credits	4

ELECTIVES		Credits
ME8100	Adv Experimental Stress Anal	1
ME8101	Advanced Engineering Design	1
ME8102	Advanced Fluid Mechanics	1
ME8103	Advanced Human Factors	1
ME8104	Advanced Heat Transmission I	1
ME8105	Advanced Heat Transmission II	1
ME8106	Advanced Mechanics of Solids	1
ME8107	AI for Mechanical Engineers	1
ME8109	Casting & Solidifn of Material	1
ME8110	Chaotic Motion	1
ME8111	Corrosion Engineering	1
ME8113	Design for Assembly & Manufac	1
ME8114	Energy Management	1
ME8115	Finite Element Methods in Engr	1
ME8117	Fracture Mechanics	1
ME8118	Info Sys Analysis & Design	1
ME8119	Intro to Composite Materials	1
ME8120	Intro to Operations Research	1
ME8122	Mech Behav of Engr Materials	1
ME8123	Mechanical Vibrations	1
ME8124	Multiple Particip/Obj Dec Making	1
ME8125	Neuro-Fuzzy Systems	1
ME8126	Nonlinear Vibrations	1
ME8127	Optimization Models	1
ME8128	Prob Models in Operation Rsrch	1
ME8130	Robotics	1
ME8131	Simulation of Industrial Sys	1
ME8132	Sequencing and Scheduling	1

ME8135	Directed Studies: Mechanical Engr	1
ME8136	Adv Fatigue Fracture Analysis	1
ME8137	Advanced Systems Control	1
ME8138	Computational Dynamics	1
ME8139	Prob Stats & Stochastic Proc	1
ME8140	Simulation Theory/Methodology	1
ME8141	Transport Phenomena in Porous Media	1
ME8142	Supply Chain Mgmt in Eng	1
ME8143	Micro and Nano Manufacturing	1
ME8144	Advanced Reliability Modeling	1
ME8145	Microelectronics Pkg Mec/Reliab	1
ME8146	Microelectromechanical Systems	1
ME8147	Intro to Continuum Mechanics	1
ME8148	Environmental Mgmt Systems	1
ME8149	Pollution Prevention	1
ME8150	Introduction to Microfluidics	1
ME8151	Combustion Engineering	1
ME8152	Introduction to Skeletal Tissue	1
ME8201	Design of Algorithms and Programming for Massive Data	1
ME8202	Machine Learning	1
ME8203	Management of Big Data and Big Data Tools	1
ME8204	Data Mining and Prescriptive Analytics	1

COURSE LISTING

Master's Research Seminar/Doctoral Research Seminar
This is a mandatory requirement for all MASc and PhD students. The course consists of one-hour seminars held on a regular basis in the Fall and Winter semesters. The seminars will focus on current research in specialized areas of mechanical engineering, and will be given by graduate students, faculty, visiting scholars and guest speakers. Each student will present one seminar based on their research work. This is a "Milestone." Pass/Fail.

Master's Thesis
The student is required to conduct advanced research on a topic related to one (or more) of the following specialty areas: thermofluids, manufacturing, materials, solid mechanics, and industrial engineering. The topic is chosen in consultation with the student's thesis supervisor, the student presents the research plan in writing, and the research is carried out under the direction of the supervisor. The student must submit the completed research in a thesis format to an examination committee and make an oral presentation of the thesis to this committee, which will assess the thesis. Through the thesis, the student is expected to furnish evidence of competence in research and a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

Master's Project
The student is required to conduct an applied advanced research project involving one (or more) of the following specialty areas: thermofluids, manufacturing, materials, solid mechanics, and industrial engineering. The student presents the project plan in writing, and the project is carried out under the guidance of the supervisor. The student must submit the completed project in the form of a technical report to an examination committee and make an oral presentation of the report to this committee, which will assess the report. This is a "Milestone." Pass/Fail

Candidacy Examination
This is a "Milestone." Pass/Fail

Dissertation
The student is required to conduct advanced research on a topic related to one (or more) of the following specialty areas: thermofluids, manufacturing, materials, solid mechanics, and industrial engineering. The topic is chosen in consultation with the student's supervisor, the student presents the research plan in writing, and the research is carried out under the direction of the supervisor and monitored by a supervisory committee. The student must submit the completed research in dissertation format to Program and School of Graduate Studies examination committees and make oral presentations to these committees, which will make an assessment. Through the dissertation, the student is expected to furnish evidence of competence in research and a sound understanding of the chosen specialty area(s). The research must lead to an original contribution of knowledge in the specialty area(s). Prerequisite: Candidacy Examination. This is a "Milestone." Pass/Fail

ME8100 Advanced Experimental Stress Analysis
Theory and applications of methods in experimental mechanics for measuring static and dynamic deformation of 2-D and 3-D models and bending of plates and shells. Techniques of electric resistance strain gage, photoelasticity, moire, holographic interferometry, laser speckle interferometry, moire interferometry, caustics, optical correlation by computer vision. Applications to problems in fracture mechanics, composite mechanics, interface mechanics and micromechanics. 1 Credit

ME8101 Advanced Engineering Design
An undergraduate education necessarily concentrates on analysis. This class focuses on synthesis. Creativity is the engine of design and analysis is the feedback governing design. Through the media of case studies, laboratory exercises, instruction, and practice, this class studies the process of design; the business of translating societal needs into real, manufacturable objects. Lecture topics will include: the hierarchical, iterative nature of design; aids to creativity; the appropriate use of analysis; the transformation from functional space to physical space; prototype design; consumer durable versus capital equipment design; and special lectures on microprocessors in machinery, optimization, and CAD/CAM. 1 Credit

ME8102 Advanced Fluid Mechanics
A general review of principles, concepts and methods in fluid dynamics will be conducted. Advanced treatment with mathematical techniques for solving specific classes of fluid-flow problems will be introduced, including: surveys of governing equations and basis theories; two and three-dimensional potential flows; surface waves; boundary-layer theory; and, shock-wave phenomenon. Antirequisite: AE8102. 1 Credit

ME8103 Advanced Human Factors
Human anatomical, physiological and psychological capabilities and limitations are considered for systematic analysis, identification and evaluation of human-machine-environment systems in order to design consumer products, equipment, tools and the workstation. Application of ergonomics principles and data compiled at the human-machine interface in industrial and other occupational settings are emphasized. 1 Credit

ME8104 Advanced Heat Transmission I
An advanced study of the transmission of heat by conduction and convection. Derivation and application of the equations governing steady and unsteady conduction heat transfer, transient conduction, and numerical solutions are examined with selected topics. Governing equations for forced and natural convection; dimensional analysis and similarity transforms are applied. Antirequisite: AE8104. 1 Credit

ME8105 Advanced Heat Transmission II
An advanced study of the transmission of heat by radiation. Topics covered include: physical properties of radiation, thermal radiation laws, characteristics of real and ideal systems, geometric shape factors, grey and non-grey system analysis, energy transfer in absorbing media and luminous gases, solar radiation. Antirequisite: AE8105. 1 Credit

ME8106 Advanced Mechanics of Solids
The class provides an introduction to the general equations of the theory of elasticity of an anisotropic solid. Elastic equilibrium and boundary value problem formulations are considered. The theories of thermoelasticity, viscoelasticity and plasticity are introduced. The class also provides an introduction to modelling of inhomogeneous composite solids, the effective moduli theory, and the elasticity of composite laminates. The fundamentals of fracture mechanics and applications to mechanical design are considered. Antirequisite: AE8106. 1 Credit

ME8107 AI for Mechanical Engineers
Introduction, Logical Foundations of AI (Conceptualization, Predicate Calculus, Semantics, Inference Procedures, Provability, Logical Implications, Resolution, True-False Questions, Fill-in-Blank Questions, Soundness and Completeness, Resolution Strategies, and Induction), Search Techniques, Heuristic Search, Rule-Based Expert Systems (Design, Problem Selection, Organization, and Uncertainty Measures), Introduction to Artificial Neural Networks, Introduction to Fuzzy Logic. Selected problems from the Mechanical Engineering field will be presented and students will be requested to develop inference engines and small expert systems for these problems. 1 Credit

ME8108 Aircraft Turbine Engines
Fluid mechanics, thermodynamics, and solid mechanics of aircraft turbine engines. Two-dimensional and three-dimensional flow theories of compressors and turbines. Unsteady flow and noise production in turbomachinery and in complete engines. Operational limitations and instabilities. Stress and associated temperature limits and influence of blade cooling techniques on turbines. 1 Credit

ME8109 Casting and Solidification of Materials
Melt Interactions. Fluid Dynamics, Mould Dynamics and Solidification Dynamics. Solidification Shrinkage. Near-net-shape Processes. Linear Contraction and Casting Accuracy. Structure, Defects and Properties of the Finished Casting. Cast Studies in Mathematical Modelling and Solidification Processing. 1 Credit

ME8110 Chaotic Motion
This class introduces the concepts of chaotic dynamics and provides the methods for identifying chaotic motions in nonlinear dynamic systems. It covers the following topics: fundamental concepts of chaos, review of analytical and numerical methods in nonlinear oscillation, chaotic motions observed in various physical systems, methods of identifying chaotic motions in experimental measurements and computer simulations, Poincare map, logistic map, bifurcation diagram, fractal dimension and Lyapunov exponent. 1 Credit

ME8112 Computat. Fluid Dynamics & Heat Transfer
The finite difference discretization method is applied to the solution of the partial differential equations arising from the mathematical modelling of fluid flow, heat transfer and combustion processes. The equations can be parabolic, elliptic or hyperbolic. Items like convergence, stability, consistency, numerical diffusion and turbulence modelling will also be presented. Antirequisite: AE8112.
1 Credit

ME8113 Design for Assembly & Manufacturing
Principles of Automated Design, Principles of DFA (Design for Assembly), Projects on DFA, Principles of DFD (Design for Disassembly), Principles of DFM (Design for Manufacturability). Issues of Concurrent Design, Automated Design. 1 Credit

ME8114 Energy Management
The purpose of this class is to introduce the concepts and techniques of energy management and conservation. The subjects that will be discussed are energy supply and demand, energy pricing, scope of the energy problem and approaches to provide solutions; energy auditing; improving energy utilization in space conditioning and steam, hot water and compressed air systems; energy savings opportunities in refrigeration and cooling systems; insulation; and electrical energy conservation. An inter-disciplinary approach will be employed in this class to provide a wider understanding of the subject. 1 Credit

ME8115 Finite Element Method in Engineering
This class presents formulation and implementation of the Finite Element Method (FEM) in engineering applications. The theory of variational and weighted residual methods is introduced. Different types of elements used in FEM for discretization of PDEs, such as linear, quadratic, isoparametric and hybrid elements are covered. The numerical methods selected for spatial integration, solution of linear algebraic equations, evaluation of eigenvalues are addressed. Antirequisite: AE8115. 1 Credit

ME8116 Flight Dynamics and Control of Aircraft.
Various analyses and tools for designing a controllable aircraft. Six-degree-of-freedom flight simulation models. Classical and modem control system techniques. Adaptive control. Digital control. Pilot-in-the-loop considerations. 1 Credit

ME8117 Fracture Mechanics
This course introduces the principles and applications of engineering fracture mechanics. The emphasis is on topics that have found practical application, including: fracture and crack growth, Griffith energy criteria, applications of linear elastic fracture mechanics (LEFM), crack tip stress fields and plastic zones, calculation of stress intensity factors, fatigue cracking, elastic-plastic fracture and the J-integral, introduction to mixed-mode and interfacial fracture. 1 Credit

ME8118 Information Systems Analysis and Design
The foundations that underlie the development of information systems are presented. The concepts, strategies, techniques, and tools for identifying and specifying information systems requirements and for developing designs are covered. A major analysis and design project is required. 1 Credit

ME8119 Introduction to Composite Materials
Intended as a first course in polymer-based fiber-reinforced composite materials. Quasi-isotropic random reinforcement, orthotropic, anisotropic and sandwich construction. Classical laminate theory: lamina/laminate stress, buckling and vibration analysis. Hydrothermal, radiation and service effects on performance. Impact, delamination and fatigue failure. Overview of basic manufacturing methods and usage in the aerospace industry. Antirequisite: AE8119. 1 Credit

ME8120 Introduction to Operations Research
This class is a graduate level introduction to the fundamental ideas of operations research. The class focuses on mathematical modelling in deterministic and non-deterministic settings. The class covers topics in the theory and application of mathematical optimization, network analysis, decision theory, inventory theory, and stochastic processes including queuing processes. The class requires background in probability theory and linear algebra as well as some skills in computer programming. 1 Credit

ME8121 High Speed Aerodynamics
Planar and conical shock waves. Expansion and shock wave interference, shock tubes. Method of characteristics. Supersonic nozzle design. Airfoil theory in high subsonic, supersonic and hypersonic flows. Conical flows. Yawed, delta and polygonal wings; rolling and pitching rotations. Wing-body systems. Elements of transonic flows. 1 Credit

ME8122 Mechanical Behaviour of Eng. Materials
The physical and mechanical metallurgy of material behaviour; failure by yielding (Von-mises and Tresca criteria); ductile and brittle fracture; fracture mechanics and design; strong solids; strengthening mechanisms; strength-structure relationships; dislocation mechanics; application of theory to fatigue, creep and creep-fatigue interactions. 1 Credit

ME8123 Mechanical Vibrations
Free and forced vibrations of elastic bodies, such as beams, plates, and shells are examined. Response due to shock and random loading is introduced. Vibration measuring instrumentation is described and several laboratory experiments are carried out. Industrial applications are studied including vibration of machinery, ships, and the response of humans to whole body vibration.
1 Credit

ME8124 Multiple Participant/Objective Dec. Making
This course consists of two major components: multiple objective decision making and multiple participant decision making. Both compensatory and non-compensatory methods for multiple objective decision making are covered. For tackling multiple participant decision making problems, the graph model for conflict resolution is presented. 1 Credit

ME8125 Neuro-Fuzzy Systems
Introduction, Neural Networks, Fuzzy Systems, Modelling Neuro-Fuzzy Systems, Cooperative Neuro-Fuzzy Systems, Hybrid Neuro-Fuzzy Systems. Generic Fuzzy Perception, Neuro-Fuzzy Control, Neuro-Fuzzy Classification, Neuro-Fuzzy Function Approximation, Using Neuro-Fuzzy Systems. 1 Credit

ME8126 Nonlinear Vibrations
This course provides students with the theoretical background to study: the dynamic behaviour and responses of SDOF or MDOF nonlinear systems in both time domain and phase plane, limiting circles, free and forced vibration of a Duffing oscillator using various analytical methods, self-excited vibration, stability of a nonlinear system, perturbation method and application to multiple degrees of freedom (MDOF) systems. 1 Credit

ME8127 Optimization Models
This course is intended to give a broad treatment of the subject of practical optimization. Emphasis will be given to understanding the motivations and scope of various optimization techniques for constrained and unconstrained problems. Linear, nonlinear and combinatorial optimization problems with roughly equal emphasis on model formulation and solution techniques. Modelling emphasis is primarily on deterministic formulation of real world applications. Selected solution techniques for each type of problem will be discussed. 1 Credit

ME8128 Prob. Models in Operations Research
This course presents the formulation and analysis of probabilistic models in operations research. Topics to be covered include Poisson processes, renewal processes, Markov chains, queuing theory, Markovian decision processes, and time series analysis. Application areas include reliability, traffic flows, production, and inventory. 1 Credit

ME8129 Rocket Propulsion
Theory, analysis and design of rocket propulsion systems. Emphasis on liquid and solid propellant systems with an introduction to advanced propulsion concepts. Review of nozzle and fluid flow relationships. 1 Credit

ME8130 Robotics
This class provides a brief introduction to the field of Robotics, a brief review of selected topics from linear algebra, and an introduction to theoretical kinematics. The main part of the class includes such topics as: robot geometry; velocity Jacobians; derivation of equations of motion; force, manipulability, inertia and compliance analysis; position and force control; optimization of kinematic redundancy; multirobot coordination; robot calibration; performance testing and characterization. The class also provides an introduction to space robots, smart structures, and walking machines. 1 Credit

ME8131 Simulation of Industrial Systems
Computer simulation of industrial systems, design of discrete simulation models, and the generation of random variables are all covered by this class. Also included is the design of simulation languages such as GPSS, SIMSCRIPT, SINWLA and SLAM. Network models, using the SLAM language, and applications of simulation models in decision making situations arising in production, distribution and economic systems are studied. 1 Credit

ME8132 Sequencing and Scheduling
The class is concerned with the analysis of the following sequencing problems: single-machine, parallel, identical and different machines, general jobshop and special cases of the jobshop and flowshop under various objective functions and assumptions. Models and algorithms for the basic sequencing problem are formulated. 1 Credit

ME8133 Space Mechanics
Motion in outer space poses complex engineering problems, the solution of which requires a thorough knowledge and understanding of the pertinent principles of mechanics and techniques of analysis. The class provides an introduction to such topics as astromechanics, satellite orbits, rotating structures with varying configuration and mass, optimization of spacecraft motion, launch dynamics, microgravity, space robotics, large displacement low frequency vibrations, ground-based and in-orbit testing. 1 Credit

ME8135 Directed Studies in Mechanical Eng.
This class is available to graduate students enrolled in the graduate program in Mechanical and Industrial Engineering, who wish to gain knowledge in a specific area for which no graduate level classes are offered. Students select an advisor and are required to present a formal report, or take a formal examination, at the end of the class. Registration approval is required from the MIE Graduate Program Director. 1 Credit

ME8136 Advanced Fatigue Fracture Analysis
This course is designed to cover specific areas: practical and analytical aspects of fatigue failure and fracture mechanics of engineering components and structures subjected to various fatigue fracture loading conditions. Topics covered include: fundamental concepts of fracture mechanics and fatigue behaviour of materials, structural damage assessment, fracture design and failure analysis for monotonic and cyclic loaded components, the stress intensity factor and J integral for monotonic and cyclic loading, fatigue and fracture data statistical analysis, practical case studies and applications, fatigue crack initiation, crack growth rate, and fatigue life prediction of both un-notched and notched engineering components subjected to the uniaxial and multiaxial fatigue loading conditions. 1 Credit

ME8137 Advanced Systems Control.
Overview of classical controls and introduction to modern control theory. Control system modeling and analysis in state space. System controllability and observability. Pole placement control design. State observers. Introduction to nonlinear control systems. Fundamentals of Lyapunov theory. Lyapunov's direct method. System linearization. Adaptive control. Antirequisite: AE8137.
1 Credit

ME8138 Computational Dynamics
The objective of this course is to study the basic modeling and computational methods for rigid and flexible multi-body systems. Computational dynamics provides a fundamental tool for analyzing and computing the motion and force for large complex mechanical systems, such as robots, mechanisms, machines, and automobiles. Applications of computational dynamics include analysis, design and control. Analysis is to study system behaviors for given inputs through modeling and simulation. Design is to determine the prescribed functions through synthesis and optimization. Control is to control mechanical systems based on the dynamic model. Antirequisite: AE8138. 1 Credit

ME8139 Mech. Engineering: Probability, Stats. & Stochastic Processes
This course is an introduction to stochastic processes and probabilistic models. Statistical interference techniques are also discussed. Topics covered include: probability and random variables, Bernoulli, Binomial, Markov, Poisson, Wiener and Gaussian models, stationarity and cyclostationarity, spectra of various signals, linear mean-square estimation, representation of random signals and Karhunen-Loeve expansion, Markov chains and processes, parameter estimation, mean variance, confidence intervals, Bayesian models, hypothesis testing. Antirequisite: EN8910 1 Credit

ME8140 Simulation Theory & Methodology
This course introduces simulation as a problem solving tool. Mathematical foundations: random variate generation, parameter estimation, confidence interval, simulation algorithm, Monte-Carlo simulation techniques and simulation languages. Examples: computers and protocols, urban traffic, harbours and airport capacity planning, manufacturing capacity planning, inventory systems. Antirequisite: EN8912 1 Credit

ME8141 Transport Phenomena in Porous Media
This course is designed to provide students with advanced knowledge of porous media phenomena. The following topics will be covered: the mechanics of fluid flow through porous media; heat and mass transfer in porous media; forced and natural convection; convection with change of phase; a porous medium approach for the thermal analysis of heat transfer devices; thermodiffusion in porous media; transport phenomena in petroleum reservoirs; the role of transport phenomena in biomedical engineering. 1 Credit

ME8142 Supply Chain Management in Engineering
This course is designed to provide graduate students with a framework for understanding the defining supply chain systems while developing an understanding of the complexity, opportunities, and pit-falls of management issues regarding these systems. Topics will include inventory theories, transportation and supply chain dynamics. Also, the organizational models that successfully allow companies to develop, implement and sustain supplier management and collaborative strategies will be covered. 1 Credit

ME8143 Micro and Nano Manufacturing
This graduate course introduces the concept of micro and nano manufacturing and measurement techniques. Specific techniques, such as focused ion beam, pulsed laser, lithography, probe microscopy etc. will be covered in detail. The optical and probe microscopy techniques for measurement at the nano scale will be discussed. Also, the current status and future of micro and nano manufacturing in the field of microelectronics, photonics and biomedical engineering will be discussed. 1 Credit

ME8144 Advanced Reliability Modelling
This course is designed to provide graduate students with a complete overview of reliability programs, including the surveillance and control program, the design and evaluation program, and the development and production reliability test. The course presents evaluation techniques and optimal reliability system design for many system structures. It also includes recent results and comprehensive fuzzy and stochastic algorithms, cause analysis, risk analysis, asset management, and application of artificial intelligence in reliability, maintainability, and availability. 1 Credit

ME8145 Microelectronics Packaging Mechanics and Reliability
This course is designed to provide graduate students with an overview of microelectronic package architecture, material and manufacturing processes, development trends, Moore's law and challenges to this law. The impact of the package structure, materials and environmental factors on the reliability of microelectronics is studied with fundamental theories of physics and mechanics, such as interfacial mechanics, fracture and fatigue of materials. The focus is on packaging mechanics and package reliability measures associated with the package design, manufacturing and operation. The methodologies and state of the art technologies for the assessment of package reliability are covered with the aim of illustrating the role of mechanical engineering in modern microelectronics. 1 Credit

ME8146 Microelectromechanical Systems (MEMS)
The course is designed to provide students with advanced knowledge of MEMS. The following topics will be covered: Introduction to MEMS, including basic terminology, history and status of MEMS; fabrication technology and commercial processes; analysis, modeling and design of actuators; analysis, modeling and design of sensors; optical design and applications; RF MEMS design and applications; BioMEMS devices; and introduction of design, modeling and simulation software. 1Credit

ME8147 Introduction to Continuum Mechanics
This course examines the fundamental aspects of continuum mechanics and familiarizes students with the essential mathematical tools of solid and fluid mechanics. The following topics are covered: (1) The continuum hypothesis; elasticity and plasticity; fluids and viscoelasticity. (2) Vector and tensor algebra; higher-order tensors; eigenvalues and eigenvectors of tensors; transformation laws of basis vectors and components; general bases; scalar, vector and tensor functions; gradient and related operators; integral theorems. (3) Kinematics of deformation. (4) Stress. (5) Conservation laws. (6) Constitutive relations. 1 Credit

ME8148 Environmental Management Systems
This course examines the reasons for Environmental Management Systems (EMSs), which enable organizations to identify and address environmental concerns. The elements of a generic EMS are explored: planning and risk assessment phases; establishment

of a policy; outline of organization arrangements; design of programs addressing specific environmental concerns; development of periodic environmental audits. The requirements of ISO 14000 are explored. Integration of EMSs with quality management systems and occupational heath and safety systems is discussed. 1 Credit

ME8149 Pollution Prevention
The course examines a number of industry-environment interactions. It discusses pollution prevention and industrial ecology, and it presents a survey of environmental concerns including material and energy budgets, life-cycle assessment, and industrial process wastes and their minimization. Design for environmental quality is discussed including energy use and design for energy efficiency. The course explores the future of industrial activity with regard to the environment and it reviews studies in selected industrial applications. Antirequisite: ES8903. 1 Credit

ME8150 Introduction to Microfluidics
Microfluidics is an emerging technology that is becoming ubiquitous in biomedical research. This course introduces students to microfluidics and its applications. Soft lithography and experimental methods will be discussed. Related physics will be reviewed, including fluid flow, transport phenomena, electromagnetism, and capillarity. Mathematical approximation and simulations will be used to solve microfluidics-based problems. Final project will be a microfluidics-based research proposal. 1 Credit

ME8151 Combustion Engineering
This course will cover combustion fundamentals and their application to engineered combustion systems such as furnaces, engines, and gas turbines, with an emphasis on maximizing combustion efficiency and minimizing pollutant formation. Topics covered will include flame stoichiometry, chemical kinetics, flame temperature, pre- mixed and diffusion flames, droplet combustion, fuel properties, continuous and unsteady combustion systems, pollution reduction techniques and safety issues. 1 Credit

ME8152 Introduction to Skeletal Tissue
Bones are composed of a mineral phase that provides hardness and a protein phase that imparts resilience. This course will consider the hierarchical structure of bone, how disease affects it and how it can be repaired by both medical and surgical intervention. When students complete this course they will understand the concepts behind the structure of bone and how it remodels with respect to both time and loading. This course will consider different medical and surgical treatments that may address the effects of disease and injury. 1 Credit

ME8201 Design of Algorithms and Programming for Massive Data
NP-completeness, approximation algorithms and parallel algorithms. Study of algorithmic techniques and To introduce students to the theory and design of algorithms to acquire and process large dimensional data. Advanced data structures, graph algorithms, and algebraic algorithms. Complexity analysis, complexity classes, and modeling frameworks that facilitate the analysis of massively large amounts of data. Introduction to information retrieval, streaming algorithms and analysis of web searches and crawls. Antirequisite: DS8001. 1 Credit

ME8202 Machine Learning
Overview of artificial learning systems. Supervised and unsupervised learning. Statistical models. Decision trees. Clustering. Feature extraction. Artificial neural networks. Reinforcement learning. Applications to pattern recognition and data mining. Antirequisite: DS8002. 1 Credit

ME8203 Management of Big Data and Big Data Tools
The course will discuss data management techniques for storing and analyzing very large amounts of data. The emphasis will be on columnar databases and on Map Reduce as a tool for creating parallel algorithms that can process very large amounts of data. Big Data applications, Columnar stores, distributed databases, Hadoop, Locality Sensitive Hashing (LSH), Dimensionality reduction, Data streams, unstructured data processing, NoSQL, and NewSQL. Antirequisite: DS8003. 1 Credit

ME8204 Data Mining and Prescriptive Analytics
The course teaches to use data to recommend optimum course of action to achieve the optimum outcome and to formulate new products and services in a data driven manner. The course will cover all these issues and will illustrate the whole process by examples. Special emphasis will be given to data mining and computational techniques as well as optimization and stochastic optimization techniques. Prerequisite: ME8202. Antirequisite: DS8004. 1 Credit

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Media and Design Innovation

CURRICULUM
First Offered Fall 2021

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Exegesis and Documentation		(Milestone)
Comprehensive Examination		(Milestone)
Dissertation Project		(Milestone)
DI8010	Doctoral Colloquium	1
DI8011	Qualitative Research Methods	1
DI8012	Practice-based Research Methods	1
DI8013	Directed Reading	1
Two Electives		2

ELECTIVES		Credits
DI8110	Directed Study	1
DI8111	Internship	1
DI8112	AI-Driven Media Innovation	1
CD8310	Topics in Cross Cultural Comm	1
CD8320	Media Lang: Forms, Approaches	1
CD8330	Audiences and the Public	1
CD8340	Media Writing: Critical & Narrative Forms	1
CD8350	Socially Engaged Media	1
JN8106	The History of News	1
PC8101	Advanced Speaking and Presentation Technology	1
PC8105	Proposal Writing, Grant Seeking and Fundraising	1

Course Listing

Exegesis and Documentation
This is a Milestone

Comprehensive Examination
This is a Milestone

Dissertation Project
This is a Milestone

DI8010 Doctoral Colloquium
The graduate colloquium is an academic seminar led by faculty affiliated with the program. The seminar will survey the fields of media and design through an interdisciplinary set of readings and guest presentations by practitioners and scholars in a relevant field. The readings will be thematically organized and subject to ongoing revision by program faculty. Field trips as relevant to student research interests will be organized. 1 credit

DI8011 Qualitative Research Methods
This seminar considers qualitative research methods such as observation, interviews, focus groups, forms of sampling, recruitment strategies, the collection of evidence and issues concerning research ethics. With an emphasis on local and global perspectives, the course prepares students to analyze the complex nature of reality via thick descriptions of human experience in terms of behaviours, beliefs, opinions, gender, ethnicity and religion in various socio-cultural and economic contexts. 1 Credit

DI8012 Practice-based Research Methods
This course explores practice-based research by considering 'ways of knowing'. This involves a philosophical discussion of how we know anything, what research means, and what is necessary for creative work to be research as well as expression, representation or communication. By examining case studies from design, art, media, music and other fields, the course will critically consider the ways in which projects, prototypes, exhibitions, objects, and events can be forms of meaningful research. 1 Credit

DI8013 Directed Reading
The directed reading course is designed to survey and review key texts that are relevant to student's research project or question. The student will develop a bibliography of readings on a topic or area of concentration under the direction of the faculty supervisor or a member of the supervisory committee. These texts will be used to contextualize the research project and will result in a completed research paper on the topic of investigation. 1 Credit

DI8110 Directed Study
The directed study course provides an opportunity for students to investigate concepts, practices and theoretical materials that are relevant to the student's developing program of research. The course will broaden perspectives beyond established course curriculum. The course will be under the supervision of a faculty member with expertise in the chosen subject field. 1 Credit

DI8111 Internship
The Media & Design Innovation PhD internship is designed to provide a situated learning experience that will advance the student's dissertation research and creative practice. Students may seek internships within the creative industries or at any relevant institution. These may include for-profit or non-profit organizations such as museums, galleries, media, technology firms, special residencies or other universities. The responsibility for securing an internship rests with the student. 1 Credit

DI8112 AI-Driven Media Innovation
This course examines AI's role in communication design, focusing on societal and organizational challenges. Students explore AI's impact on communication, media design, user experiences, and information dissemination across cultures. While covering AI fundamentals, the course emphasizes critical analysis of its effects on communication, ethics, design, and policy. Through interdisciplinary methods, students engage with case studies, projects, and research initiatives addressing AI's complexities in contemporary communication.

CD8310 Topics in Cross Cultural Comm
The term *cross-cultural competence* denotes a vast complex of competencies, which educators, politicians and business leaders around the world have identified as one of the most crucial of the 21st century. The purpose of this course will be to foster such "competence" through a wide-ranging examination of the major social issues that affect communication across national and cultural boundaries. 1 Credit

CD8320 Media Lang: Forms, Approaches
This interdisciplinary course will investigate both common elements (visual and auditory narratives, methods of presentation/distribution, cultural roles) and specific attributes (individual characteristics and technologies) of contemporary media forms. Key developments in the evolution of media types and media languages will be explored in the larger context of understanding critical and theoretical issues associated with these forms and languages. 1 Credit

CD8330 Audiences and the Public
The course addresses the challenges concerning value creation and the effective design and delivery of media/mediated products and services from the perspective of the audience. The course brings an interdisciplinary conceptual framework to bear on contemporary media and mediated consumption to investigate five principal ways of audiencing (citizen, spectator, customer, user and player) as well as the new audience sociability and several key issues around managing it: metrics, presumption, fans, transmedia, and business models. 1 Credit.

CD8340 Media Writing: Critical & Narrative Forms
This course will explore issues of form, expression and viewpoint in writing for contemporary visual arts and media. The emphasis will be on essays and critical studies, but writing of summaries, proposals and analyses will also be covered. Traditions of literary and arts criticism form a basis for study of contemporary writing practices for both print and screen-based media. 1 Credit

CD8350 Socially Engaged Media
Bringing together masters students in Social Work and Documentary Media, this research/creation seminar explores socially engaged practices which privilege collaboration and social interaction in an interdisciplinary dialogue. These practices adopt and borrow from such disciplines as pedagogy, theatre, ethnography, anthropology, art and social work. Through praxis we will explore common methodological problems faced by researchers and practitioners in relation to their subjects and communities. 1 Credit.

JN8106 The History of News
This course will study the evolution of journalism from 1600 to the present, with a particular (but not exclusive) emphasis on developments in Canada. It will examine the various forms that news took at different periods and in different places; how news influenced culture and was influenced by it, as well as by changing technology, business organization, and markets; how different audiences used and responded to news; and how the producers of news understood their work in relation to their society, their audiences, their employers and their peers. 1 Credit

PC8101 Advanced Speaking and Presentation Technology
This course builds upon fundamental informative and persuasive speaking techniques by introducing students to their advocacy role as professional communicators. Students learn how to adapt high-level messages for a variety of internal and external audiences and effective audience-response strategies. They will learn the use of presentation technology such as PowerPoint, podcasting, and webcasting to transmit their messages effectively. Theories of self-presentation, presentation protocol, medium and message, and cognitive perception underlie the course. Students will deliver presentations to their peers and have the opportunity to use new media facilities to create and broadcast audio podcasts and videocasts for feedback and evaluation. Spoken voice training to achieve clarity and confidence in oral communications is a part of this course. 1 Credit

PC8105 Proposal Writing, Grant Seeking and Fundraising
This course provides a detailed introduction to the multidimensional processes of grant-seeking and the strategic principles of writing proposals for research funding and non-profit fundraising. Through a theoretical framework grounded in classical and modern rhetoric, meta-rhetoric, and narratology, students will explore how professional communicators construct polished arguments to generate support. From the perspective of both grant seekers and multidisciplinary peer-review audiences, students will learn how to identify and target government, foundation, and corporate funding sources/opportunities, to translate project goals and problem statements into clear objectives and hypotheses reflective of societal need, and to coordinate activities in the planning, development, structuring,

and articulation of feasible, methodologically rigorous, and conceptually innovative research projects/proposals. Students will also gain practice in applying these techniques to fundraising initiatives and tasks including outreach and the cultivation of potential foundation and corporate donors. 1 Credit

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MEDIA PRODUCTION

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
MP8100	Project/MRP Development	1
MP8101	Creative Research Methods	1
MP8102	Aesthetic and Communication Theory	1
MP8103	Media Entrepreneurship and Leadership	1
Two Credits from Media Production Electives OR two credits from Communication & Design Electives		2
One Credit from Interdisciplinary Electives		1
AND		
One of the Following Options:		
	Professional Project	(Milestone)
	Major Research Paper	(Milestone)

ELECTIVES

Media Production

MP8901	Internship	1
MP8904	Advanced Media Management	1
MP8907	Television Programming	1
MP8908	Business of Producing I	1
MP8909	Business of Producing II	1
MP8910	Production Management	1
MP8912	Social Justice Media	1
MP8913	Media Entrepreneurship	1
MP8915	Legal Issues in Media	1
MP8918	Ethics in Media	1
MP8921	Advanced Audio Theory	1
MP8922	Business Case Studies in Comm	1
MP8924	Canadian Television Studies	1
MP8927	Business of Music I	1
MP8939	Aboriginal Media Art	1
MP8941	Dramatic Writing	1
MP8943	Comedy Writing	1
MP8944	Writing for Animation	1
MP8945	Writ: Factual & Reality Prog.	1
MP8956	Children's Programming	1
MP8957	Documentary Production	1
MP8961	2-D and Object Animation	1
MP8964	Emerging Tech for Media Makers	1
MP8972	Television Technical Producing	1
MP8974	Aud Post-Prod and Sound Design	1
MP8975	Sound Synthesis	1
MP8979	Radio Production	1
MP8981	Beyond the Radio Format	1
MP8982	Video Compositing, Special Eff	1
MP8983	Interactive Storytelling	1
MP8984	Digital Media for Evolving Audiences	1
MP8985	Factual and Entertain Features	1
MP8986	Digital Project Lab	1
MP8987	Physical Computing	1
MP8988	Editing Specialty	1

MP8989	Media Markets/Entrepreneurship	1
MP8990	Directed Reading	1
MP8991	Directed Study	1
MP8995	Special Topics in Media Production	1
MP8996	Beyond the Radio Format	1
MP8997	Sound Media	1
MP8998	Discoverability and Distribution	1
MP8999	Youth and Media	1

Communication & Design

MP8110	Exponential Potential - Media Innovation	1
CD8310	Topics in Cross-Cultural Comm	1
CD8320	Media Lang: Forms and Apprches	1
CD8330	Audiences	1
CD8340	Media Writing: Critical & Narrative Forms	1
CD8350	Socially Engaged Media	1
CD8351	Documentary as Oppositional Practice	1
JN8106	The History of News	1

Interdisciplinary

CC8921	Visual Culture	1
CC8925	Reading Television	1
CC8950	Current Issues: Telecommun	1
CC8976	Digital and Interact Entertainment	1
CD8330	Audiences	1
DM8301	Adv Topics in Documentary Media	1
DM8303	Hist, Historiography: Vis Arts	1
DM8304	Dig Med: Theoretical Framework	1
DM8305	Dbs, Arcs, Virt Exprnce of Art	1
DM8306	Studies in Culture, Perception	1
JN8105	Journ Prac: Critical Approach	1
JN8106	The History of News	1
MP8110	Exponential Potential - Media Innovation	1
MP8111	Social Cult Impl of New Media	1
MP8112	Race, Sexuality and Screens	1
MP8113	Digital Stereoscopic 3D Cinema	1
MP8120	Special Topics: Interdisciplinary	1

COURSE LISTING

Professional Project, Major Research Paper
Students will engage in a series of production activities, most notably formatting and disseminating their work for audience consumption. Continuing their collaboration with a faculty supervisor, production teams, industry, and public partners, students apply advanced theoretical, aesthetic and practical production skills and/or applied research methods and methodologies. It is expected that students will develop the ability to successfully resolve complex theoretical and aesthetic challenges within a professional production environment and/or develop sophisticated reports, articulating and potentially disseminating the outcomes of their research. These are “Milestones.”

MP8100 Project/MRP Development
This course provides an introduction to the philosophy, language, methods and goals of creative research inquiry. The course explores both qualitative and quantitative research methods used in media and considers the fundamental principles, processes, values, and roles of research for professional application in media arts. The course also provides the basic skills needed in evaluating, planning, designing, executing and disseminating research. 1 Credit

MP8101 Creative Research Methods
This course will take a practical, creative and theoretical approach to research, examining knowledge as discursive (socially constructed) practice symbolizing both inclusion and exclusion. Students will acquire the range of skills required for research-creation from proposal-writing to dissemination, as well as a variety of qualitative research modes including creative visual research, archival

research, and ethnography/autoethnography, applying them to students' thesis projects, to create practice and to media research in general. 1 Credit.

MP8102 Theories in Popular Media Entertainment
This seminar focuses on popular culture and the culture industry, especially mediatized entertainment. The seminar builds on students' prior media knowledge and/or industry experience and explores the key concepts, issues, and theories relating to ways of understanding and valuing entertainment-oriented media products. Through theory informed practice, students develop a reliable knowledge of how and why aesthetic experiences are sought and valued.. 1 Credit.

MP8103 Media Entrepreneurship and Leadership
This advanced seminar will present case studies from expert media practitioners on a variety of topics including sound, images, new script forms, documentary production, dramatic and comedic shows, pitching production ideas, funding, managing broadcast networks, performing, marketing media products, human resources issues, developing research projects, and more.. 1 Credit

MP8110 Exponential Potential - Media Innovation
This graduate research seminar focuses on examining unprecedented challenges and career opportunities in the historically transforming local-global media ecosystem, including media's role in kick-starting the Fourth Industrial Revolution. The course analyses exponentially accelerating disruptions in media technology, market dynamics, global competition, business models, firm capabilities, and their impact on Canada's content production sector and media policy framework. Readings are drawn from business disciplines, including case studies. Students complete a research paper on a selected topic. 1 Credit

MP8111 Social Cultural Implications of New Media
This course focuses on the changes brought about by changes in communication technology for individuals, groups and organizations, and the challenges and opportunities presented by them. Antirequisite: CC8963(CMCT 6504 3.0) 1 Credit

MP8112 Race, Sexuality and Screens
Since the birth of cinema, gender and race have functioned as both object of desire and figure of horror. As screens proliferate in the 21st century, we will interrogate theories of looking and the gaze while viewing work from various genres in film, TV, gaming and new media. We will utilize feminist/queer/race theory, cultural studies, and psychoanalytical approaches to analyze both media content and audiences. 1 Credit

MP8113 Digital Stereoscopic 3D Cinema
This course will provide a foundation in stereoscopic 3D cinema. A theoretical foundation in human stereopsis based on perceptual vision science and human factors will lead to the understanding and application of basic stereography. Students will be trained on a range of stereoscopic rigs, as well as the complete digital workflow during the creation of short S3D projects. 1 Credit

MP8120 Special Topics: Interdisciplinary
A seminar course for special interdisciplinary initiatives in the department. Topics will vary from year to year. 1 Credit

MP8901 Internship
Students undertake an Internship in the media industry. With their Internship students ideally should advance their career interests by developing personal contacts and a better understanding of the business and creative aspects of media. Entry into this course is by application and proposed Internships must be approved by the Director of the Masters of Media Production program and the student's faculty Supervisor who oversees the Internship. 1 Credit

MP8904 Advanced Media Management
In this course, students will learn about organizational behavior in the media industry. Topics will include theories of employee motivation, individual behaviour, interpersonal and organizational communication, perception and personality in organizations, work attitudes and values, team dynamics and effectiveness, organizational power and politics, conflict and negotiation, leadership, and stress management. Antirequisites: BDC904, RTA904 1 Credit

MP8907 Television Programming
This course will examine the programming strategies of television networks, local stations, specialty and pay TV services and international cable and satellite channels. Students will learn how program scheduling, content acquisition and production decisions are affected by everything from market forces and budgets to interactive TV and new media and technologies. Students will also analyse the impact of U.S. signals, international syndication, co-production, advertising and barter. Antirequisite: BDC907, RTA907. 1 Credit

MP8908 Business of Producing I
From the vantage point of the independent producer, students study the business and legal aspects of independent productions. Students examine how producers work with broadcasters, content creators, internet channels, interactive and transmedia platforms, funding agencies and financiers. Students also explore the business aspects of pitching (selling), developing, financing, producing, post-production and commercial exploitation/distribution of creative media properties. Antirequisite: BDC908, RTA908. 1 Credit

MP8909 Business of Producing II
This course builds on executive producing skills developed in RTA908/MP8908. Students form teams to develop the creative, financing, production, and business materials necessary for a complete series proposal for an independent production. These proposals will be competitively pitched to a panel of broadcasters and producers. This course is hands-on with creative, budgetary and business workshops and is intended for those students interested in creating and executive producing television and related transmedia projects. Antirequisite: BDC909, RTA909. Prerequisite: MP8908. 1 Credit

MP8910 Production Management
This course focuses on the role of the production manager in film and television. Students will become acquainted with all aspects of a production: development; pre-production; production; post-production. Topics will include legal aspects, financing, insurance, script breakdown and scheduling, budgeting, accounting and cost reports, location management, talent and crew unions, contracts, reporting mechanisms and relevant forms and paperwork as well as a review of key production personnel job descriptions and tips on getting hired. Antirequisite: BDC910, RTA910. 1 Credit

MP8912 Social Justice Media
Most of us are online most of the time. How do marginalized communities fare in this virtual space…or on other platforms? This course will present an exciting roster of media artists/theorists from LGBT, feminist and racialized communities, who use research and art to forge alternate discourses and visual/virtual worlds. We will also engage with films and theory to do with social justice media and activism. Part lecture series and part seminar, this course will discuss how diversity and activism can work together to produce creative work that can speak out and create social change. 1 Credit

MP8913 Media Entrepreneurship
In an ever changing industry media graduates must look beyond salaried employment in the corporate or public sector. This course assists media students to develop entrepreneurial options for themselves in the media industry, focusing on growth-oriented business venturing. In the first half of the course, students are introduced to entrepreneurship and business venturing. In the second half of the course, each student develops a business plan for a media startup. Antirequisite: BDC913, RTA913, ENT500, ENT726. 1 Credit

MP8915 Legal Issues in Media
This course will provide students with a deeper understanding of the concepts and legal process inherent in the business of broadcasting and communications. Topics to be covered include copyright, contracts, clearance of program rights, legal issues relating to the internet and multimedia. Issues in entertainment and sports law will also be reviewed, as will government regulation of the broadcasting and multimedia industries. Antirequisite: BDC915, RTA915. 1 Credit

MP8918 Ethics in Media
This course explores ethical and legal case studies in a business context, analyzing problems that arise in typical broadcasting and new media environments. The student's responsibility to society and the ethical choices they will be required to make are compared to the legal framework (both regulatory and statutory) within which they will be working. Antirequisite: BDC918, RTA918. 1 Credit

MP8921 Advanced Audio Theory
This course is an exploration of Audio Theory for advanced applications. The course will cover modern audio practice as it applies to sound recording studios, live sound and sound reinforcement systems, acoustics and room and studio design, electronic and digital circuits and systems, computer applications in audio as well as Digital Signal Processing and compression systems and technology. Antirequisite: BDC921, RTA921. 1 Credit

MP8922 Business Case Studies in Communications
Students conduct case studies exploring particular aspects of the media industry. They focus on how components of the production industry and broadcasting system function. Areas of study will include government regulation, market fragmentation, corporate consolidation, new technologies, cultural sovereignty, and international media production and distribution. Students present their findings in class and lead discussion on their particular subject. They also explain what makes their individual research important in the broader context. There is a combined ancillary fee of $2200. Antirequisite: BDC922, RTA914. 1 Credit.

MP8924 Canadian Television Studies
This theory-based course comprises a broad-ranging and multi-genre look at Canadian media, with a particular focus on television content from the 1960's to the 21st century, including ways that audiences interact with national broadcasting. We will also examine digital technologies, global discourses of runaway production, and cross-border export/franchise, with a critical look at national myths and practices in the digital era. Antirequisite: BDC924, RTA940. 1 Credit

MP8927 Business of Music I
This course will explore the history of the music business, music industry organization and the roles of record companies, publishers, songwriters, unions and managers. Topics include A&R, marketing, promotion, sales, business affairs, finance and the use of music in film, TV and advertising. Antirequisite: BDC927, BDC905, RTA927, MP8905. 1 Credit.

MP8939 Aboriginal Media Art
This course explores Aboriginal media art in the context of the major political and social discourses currently informing contemporary First Nations art. Through screenings, readings and guest artists we will examine critically engaged community-based art practices in the context of Aboriginal aesthetics. Two-spirit, gender, class and race issues will be seen through the lens of Aboriginal artists. The course will compare the function of art from an Aboriginal worldview with that of a Western one. Antirequisite: RTA939. 1 Credit

MP8941 Dramatic Writing
This course demystifies the process of writing for the screen and encourages students to find their unique dramatic voice by writing an original script. Students analyze principles of dramatic storytelling and current dramas at the script level. Using story editing exercises, students learn how to structure a story, build dramatic tension and craft moving characters. By the end of the course, students develop an appreciation of the nature and purpose of drama. Antirequisite: BDC941, RTA941. 1 Credit

MP8943 Comedy Writing
This course covers the fundamentals of comedy writing with special focus on the techniques of writing comedy for television and the

web with an emphasis on sketches and sitcoms. Students take part in story editing exercises, designed to simulate industry practices. This course's key goal is to develop students' creative and comic voice in their writing. Antirequisite: BDC943, RTA943. 1 Credit

MP8944 Writing for Animation
This course is designed to cover the fundamentals of writing for animated series designed for television and other platforms. Students will learn the language and process of writing for animation and consider the rich creative history of animation. Students will be required to create a fully realized animated script by the end of the semester. Antirequisite: BDC944, RTA944. 1 Credit

MP8945 Writing for Factual and Reality Programs
In this course students learn the story chasing/development, writing techniques and production practices related to lifestyle, current affairs, science, business, entertainment and 'reality' programming. Students learn how to shape their research, found material, interviews, narration, b-roll and stills into coherent and emotionally engaging stories while working within tight constraints of time, genre and format. Students also analyze the ethical dilemmas and social trends that fact-based and reality programming represent. Antirequisite: BDC945, RTA945. 1Credit

MP8956 Children's Programming
This course explores the dynamic world of children's media storytelling. Students will examine content creation, consumption, and impact across various platforms; engage with industry professionals; and collaborate to develop an original children's media oncept. Through critical reflection and creative projects, students explore key considerations in producing content for young audiences including child development theories, representation, and industry trends. The course cultivates analytical and creative skills applicable to children's media production, research, and criticism. Antirequisite: BDC956. RTA956. 1 Credit

MP8957 Documentary Production
This course provides an opportunity for students to produce a documentary short subject, building on key theoretical concepts and storytelling skills developed in Introduction to Documentary. Students will work in teams to produce an original 20-minute documentary. Students will develop basic competencies in documentary pre-production, production and post-production practices and create a trans-media strategy to develop the documentary across other media platforms. Antirequisite: BDC957, RTA957. 1 Credit.

MP8958 Media Production Lab I
In this production lab course, students will select from a series of hands-on media production sessions on a variety of audio, video and new media equipment and complete finished media modules under the supervision of faculty, media experts and technical staff. Students will then begin advanced research on media products and tools that are important to the completion of their professional project. 1 Credit

MP8959 Media Production Lab II
In this production course, students will progress toward their major thesis projects through a series of hands-on workshops in ideation, writing, production and post-production, adapted to their needs and skill levels. As students practice and hone their authorial voices, tactics for establishing realistic production workflows and timelines are developed. Through peer and instructor feedback, students will deepen their understanding of the challenges and opportunities facing their projects. 1 Credit

MP8961 2-D and Object Animation
This course is an introduction to the world of 2-D animation and stop-frame object animation. It will include discussion of the history and aesthetic aspects of animation and also allow students to produce their own pieces. Equipment and software for simple animated projects will be introduced, and film, video, new media and interactive forms of delivery will be discussed. Antirequisite: BDC961, RTA961. 1 Credit

MP8964 Emerging Technology for Media Makers
This course covers developing practices, cultures and technologies at the intersection of digital and real-world production. Students will discuss and create within Virtual Worlds, Augmented Reality, virtual characters/sets and location-aware content, analyzing developing trends and creating innovative cross-media content. Antirequisite: BDC964, RTA964. 1 Credit

MP8972 Television Technical Producing
An advanced course in television technical producing, this course is a continuation of technical production knowledge obtained in previous "context" and craft courses in television (both multicamera and EFP). Students will explore large live-event coverage (sports, elections, music specials, awards shows), and tours will be arranged to technical production facilities in the Toronto area. The course culminates with a live teleproduction at the end of the semester. Antirequisite: BDC972, RTA969. 1 Credit

MP8974 Audio Post-Production and Sound Design
This course will introduce students to the creative and technical aspects of creating a soundtrack for the moving image. Through a combination of lecture, screenings, discussion, and practical workshop modes, students will learn about the audio post production process, including dialog recording and replacement (ADR), Foley and sound effects editing, music and score, and mixing techniques. Antirequisite: BDC974, RTA971. 1 Credit

MP8975 Sound Synthesis
This course will cover practices and principles of analog and digital sound synthesis and their historic origins; related audio equipment and applications; theories of sound samplers; algorithmic composition; synthesizers and sequencers; computer music; digital signal processing; computer synchronization; and MIDI applications in sound synthesis and recording production. Advanced sound synthesis techniques are studied and supplemented with sound synthesis studio laboratory work. Antirequisite: BDC975, RTA972. 1 Credit

MP8979 Radio Production
The course will explore commercial and public radio programming and production. Radio advertising and formats will be explored. Students will have the opportunity to practice their skills in these areas by planning and producing content that reflects various formats and target demographics. Antirequisite: BDC979, RTA974. 1 Credit

MP8981 Beyond the Radio Format
In this course, students will learn about the role of public broadcasting in Canada and beyond, and produce public-style programming such as Current Affairs, Arts and Entertainment, Drama, etc. Additionally, students will study audio podcasting's asynchronous, subscription-based approach and produce their own pilot podcast. Antirequisite: RTA996. 1 Credit

MP8982 Video Compositing, Special Effects
A large number of images that appear on our TV screens are treated with special effects prior to completion. Students will work with a range of basic image treatment software and will acquire skills on more sophisticated systems both on and off campus. They will learn the why and when for such effects treatments as special effects decisions can involve ethical elements. Antirequisite: BDC982, RTA975. 1 Credit

MP8983 Interactive Storytelling
This studio course introduces students to the fundamental concepts and strategies for creating interactive and nonlinear narratives. Students learn classic theories of storytelling and editing, as the foundation to crafting compelling interactive narratives. Through a series of projects, students are introduced to different methodologies for creating interactive narrative experiences, including the creation of storyworlds and narrative maps, and the use of character, perspective and time to build choice and viewer agency into the narrative experience. Antirequisite: RTA320. 1 Credit

MP8984 Dig Media: Evolving Audiences
As social practice, technologies and media content change in the 21st century, our understanding of the types of stories we can tell and our relationship with an active, participatory audience has radically shifted. This course introduces students to the ideas of transmedia narratives and cross-media projects, discusses the properties of various content-platforms for interaction, and examines the dynamics of participatory audiences. Antirequisite: RTA317. 1 Credit

MP8985 Factual and Entertainment Features
There is a broad spectrum of stories on television and radio that are fact-based but also meant to be artistic and entertaining. This course allows students to focus on these features, learning to create unique personal stories by developing the characters in their stories through specific styles of writing and interviewing. Students will choose an entertainment/feature program and do an extensive deconstruction of it. Students will work in teams to produce a ten minute feature. Antirequisite:BDC985, RTA977. 1 Credit

MP8986 Digital Project Lab
This course offers a unique opportunity to build a digital project with a full interdisciplinary team. Students from multiple disciplines/programs form teams to develop functional digital prototypes. Projects will be cutting-edge Mixed Reality work including wearable technology, location- and context-aware computing, socially-connected apps, and novel interaction paradigms. Teams work closely with professors and mentors to learn new production-skills in digital creativity, collaborative work, programming, demo videos, documentation, and presentation skills. Antirequisite: DG8306. 1 Credit

MP8987 Physical Computing
Using the human body and our senses (vision, acoustic, touch, taste, smell, proprioception – physical sense of self movement) as an organizing model, this course introduces students to Physical Computing practices. Students will learn about digital and analog sensor systems, be introduced to micro-controllers, computer sensor systems and ubiquitous computing. Antirequisite: DG8112. 1 Credit

MP8988 Editing Specialty
This is an in-depth course designed to provide a thorough understanding of video editing techniques and processes. Through exercises, the process is followed from the initial planning stages to the final edit session. Topics covered include aesthetics and emotion, the importance of audio in video productions, story structure and the editing of different genres. Students apply this knowledge to execute a series of projects in a professional editing environment. Antirequisite: BDC988, RTA978. 1 Credit

MP8989 Media Markets/Entrepreneurship
Availability of fast and ubiquitous communications networks and the advent of powerful mobile devices such as mobile phones, tablets and wearable technologies have created new opportunities for media economics and how media is curated and consumed. The next generation of media economics and the effect of crowd sourcing, collective intelligence and role of Data Science will be discussed. Students will be exposed to new business models and will learn the importance on product design, and digital media entrepreneurship, its requirements and best practices. Antirequisite: RTA989. 1 Credit

MP8990 Directed Readings
The directed reading course is intended to permit the student to survey a coherent body of literature in an area of study related to the student's program objectives. 1 Credit

MP8991 Directed Study
The directed study course is designed for individual students with specialized interests that may not be satisfied through course offerings in a given year. The course will be under the supervision of an assigned faculty member with expertise in the chosen subject field. 1 Credit

MP8995 Special Topics in Media Production
Each semester will be devoted to special topics in response to the changing practices and needs of the department and students. This course is designed to provide opportunities for postdoctoral fellows, visiting lecturers and YSGS appointed faculty to teach specialty courses in the field of Media Production. 1 Credit

MP8996 Beyond the Radio Format
1 Credit Antirequisite RTA 996

MP8997 Sound Media
1 Credit Antirequisite RTA 907

MP8998 Discoverability and Distribution
How to make creative content accessible to its intended audience is key to any media production's success. In this course, students learn about the various channels of dissemination and distribution of traditional and new forms of media. Students analyze how content success is measured and monetized. Students learn to develop audience development plans for specific content leveraging audience analytics and optimize the market potential and audience engagement. Antirequisite: RTA801. 1 Credit

MP8999 Youth and Media
This course explores the role of media and technology in young people's lives. Students are introduced to foundational concepts across media, cultural, and childhood studies to consider topics such as identity and development, media literacy, social and cultural impacts, and youth-specific media production considerations and practices. Coursework includes critical reflection and analysis of media produced for young audiences, and creative experimentation towards more resonant and inclusive content and experiences with, by, and for youth populations. Antirequisite: RTA880. 1 Credit

Communication and Design Electives
see COMMUNICATION AND DESIGN SECTION

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MOLECULAR SCIENCE

CURRICULUM
Major revision Fall 2025

Master of Science

DEGREE REQUIREMENTS		Credits
Master's Thesis		(Milestone)
MS8201	Master's Seminar 1	Pass/Fail
MS8202	Master's Seminar 2	Pass/Fail
One Credit from the Electives list		1

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
MS9201	PhD Seminar	Pass/Fail
Two Credits from the Electives list		2

Electives

ES 8909	Environmental Biotechnology	1
MS8101	Adv Analytical Chemistry	1
MS8102	Adv Microscopy and Imaging	1
MS8103	Genomics and Proteomics	1
MS8104	Interfacial Phenomena	1
MS8105	Molecular Recognition	1
MS8106	Materials Science	1
MS8107	Molecular Virology	1
MS8108	Adv Structure Determination	1
MS8109	Directed Studies Molecular Sci	1
MS8110	Advanced Organometallics	1
MS8111	Experimental Design and Statistical Analysis	1
MS8112	Molecular Machines of the Cell	1
MS8113	Molecular Basis of Pathogen, Host and Env Interactions	1
MS8114	Glycobiology	1
MS8115	Organic Methodology	1
MS8116	Meta-analysis for Scientists	1
MS8117	Molecular Ecology	1
MS9210	Directed Studies Mol Sci PhD	1

COURSE LISTING

Doctoral Candidacy Examination
Each student is required to complete a Candidacy Examination. The examination is normally conducted during a candidate's fourth term of residence, and must be held no later than 20 months from the date of initial registration. The examination consists of two parts: a written examination of three hours duration, the questions to be set by the student's Supervisory Committee; and an oral defense of the written examination and of the dissertation proposal. Only students who have entered the PhD program via a Transfer Exam are exempt from the Candidacy Exam. This is a Milestone. Pass/Fail

Doctoral Dissertation
This is a laboratory-based research project. Students are required to conduct research, submit their completed research in a thesis format to an examination committee, and make an oral presentation and defence of the research thesis and results to this committee. Through the thesis, students are expected to demonstrate competence in oral and written communication, experimental design and

scientific thought processes, as well as a sound understanding of the specialty area associated with the research. The PhD Thesis is a “Milestone.” Pass/Fail.

Master's Thesis
This is a laboratory-based research project. Students are required to conduct research, submit their completed research in a thesis format to an examination committee, and make an oral presentation and defence of the research thesis and results to this committee. Through the thesis, students are expected to demonstrate competence in oral and written communication, experimental design and scientific thought processes, as well as a sound understanding of the specialty area associated with the research. The Master’s Thesis is a “Milestone.” Pass/Fail.

ES 8909 – Environmental Biotechnology
This course, as a series of lectures and student-led discussions, covers the application of biologically-based technologies in bioenergy and bio-remediation. Areas of application covered include biologically-based remediation of air, soil, solid waste, wastewater, bio-energy, and biofuels. The relevant technologies are discussed along with the potential positive and negative impacts which may be associated with the use of biotechnologies in the environment. 1 Credit

MS 8101 - Adv Analytical Chemistry
This course focuses on the principles and applications of modern methodologies for identifying and quantifying analytes. Topics may include advanced instrumentation (e.g. mass spectrometry, x-ray spectrometry, 2D chromatography) and chemometric techniques (e.g. PCA, PCR, PLS). Examples or case studies will be derived from the chemical literature, and may include applications to chemical, biochemical (e.g. protein analysis), clinical, environmental, food or pharmaceutical analysis. 1 Credit

MS8102 Adv Microscopy and Imaging
This course will provide students with an understanding of modern microscopic methods in chemistry and biology. Emphasis will be on theory and application of confocal microscopy, atomic force microscopy (AFM), confocal Raman microscopy and ultrasound-based approaches. All topics will be discussed in the context of scientific research based on recent publications. 1 Credit

MS8103 Genomics and Proteomics
This course is an introduction to genomics and proteomics. Topics may include the relationship between structure and function of a gene; tools used in discovering and identifying sequences in a particular genome; an overview of protein structure and function; tools for structural determination; analysis of protein-protein interactions; introduction to the high throughput identification and quantification of protein expression; review of the Human Genome project; application of genomics and proteomics to drug design. Graduate students will require additional evaluation to the undergraduate requirements and may give a seminar or lecture. Antirequisite: BLG800. 1 Credit

MS8104 Interfacial Phenomena
This course introduces fundamental concepts of interface science in relation to biological and chemical systems. Topics may include artificial assemblies of biomolecules (e.g. lipids, proteins, polysaccharides) that perform novel functions, self-assembled monolayers, nanoparticles, and physiochemistry of microbial adhesion. Selected experimental methods may be discussed. Student-led seminars are an essential component of the course. 1 Credit

MS8105 Molecular Recognition
This course provides a selective introduction to topics in molecular recognition from a chemical/biochemical and biological perspective. Model systems are used to understand fundamental principles of molecular recognition and these concepts are then used to examine topics may include antibody-antigen interactions, adhesion-receptor recognition, drug-ligand interactions and macromolecular interactions in gene expression and signal transduction. Investigative techniques including molecular graphics and modeling, mass spectrometry and X-ray crystallography will be discussed. 1 Credit

MS8106 Materials Science
This course focuses on the relationship between the synthesis, properties and function of specialty materials with extended structures. Topics may include important conducting materials such as charge-transfer salts, semiconductors, superconductors, and organic and inorganic polymers; optoelectric materials; zeolites and nonporous structures, supramolecular assemblies such as liquid crystals and piezoelectric thin films. Biological topics may include artificial bone, synthetic blood, and bio-polymers for drug delivery. Student-led discussions and seminars are essential components of the course. Antirequisite: CHY445. 1 Credit

MS8107 Molecular Virology
An overview of virology with emphasis on the contribution virology has made to molecular biology will be presented. Detailed analysis will be done of molecular structure/function relationships of specific viruses with impact on societal issues. Included will be viruses causing the AIDS, common cold, influenza, hepatitis, SARS, herpes and adenovirus infections, and others. Molecular pathogen-host interactions will be examined and current and/or potential therapeutic targets and uses will be identified. 1 Credit

MS8108 Advanced Structure Determination
This course focuses on the modern methods used to determine the structures of small molecules, polymers and biopolymers (proteins and nucleic acids), using nuclear magnetic resonance spectroscopy, mass spectrometry and X-ray crystallography. The course will cover the theory behind the techniques and advanced applications of the techniques in the determination of structures. Emphasis will be placed on deciding which technique(s) are most appropriate for solving a given structural problem, as well as the interpretation of spectra/data. 1 Credit

MS8109 Directed Studies in Molecular Science
Individual directed study in a specific area of molecular science not addressed in the current curriculum can be undertaken by a student under the supervision of a faculty member, usually the thesis supervisor. A program of supervised, advanced study related

to the student's area of concentration and reflecting the interdisciplinary nature of the program will be developed on an individual basis with the supervising faculty member. The program of study must be approved by the supervising faculty member and the program director at the beginning of the term of study. 1 Credit

MS8110 Advanced Organometallics
This course will cover the preparation, mechanisms and application of organometallic catalysts for a wide variety of purposes ranging from synthetic improvements in organic chemistry to the applications that have revolutionized the polymer industry, solar cell and fuel cell designs. The course will also examine the role of these catalysts in the environment and the environmental impact of these highly useful materials. The course will explore questions including: "Is there such a thing as a green metal catalyst?" "What are the tangible environmental impacts?" and "How can we design materials that improve function with a net zero environmental impact?" 1 Credit

MS8111 Experimental Design and Statistical Analysis
This course will cover some basic experimental designs (e.g. factorial, fractional factorial, Plackett-Burman, Latin square and blocking designs) used in chemistry and biology. Modern statistical methods for calibration and pattern recognition and methods for analysing time-series data will be discussed. It is expected that students will be familiar with basic statistical concepts, such as t tests, F test, linear regression, and ANOVA. Antirequisite: BLG409. 1 Credit

MS8112 Molecular Machines of the Cell
This course will discuss the molecular structure and function of various cellular macromolecular machines such as the proteosome, or ribosome. The course will address how structure determines biochemical and cellular function, how subunit interface and surface properties drive complex assembly and/or disassembly and how cells modulate and integrate the function and activity of such molecular assemblies. Students will learn about the molecular machines of the cell by reading original research and review articles. Classes will consist of invited seminars, lectures and discussion of research articles. Assessment will be undertaken by participation during class, a presentation and a major research essay. 1 Credit

MS8113 Molecular Basis of Pathogen, Host and Env Interactions
This course aims at understanding the interplay between hosts, bacterial pathogens and environmental factors at the molecular level. Specifically, molecular mechanisms of pathogenesis will be addressed at the interface of host, pathogen and their environment. Following initial team-taught introductory lectures, students will lead deconstructive analyses of current publications on relevant topics suggested by instructors. 1 Credit

MS8114 Glycobiology
This course deals with the role of carbohydrates in biology and disease. Topics will include the monosaccharide building blocks and their linkages, glycoconjugates (glycoproteins, glycolipids and proteoglycans), their physiological functions and how they are synthesized. The roles of carbohydrate receptors in molecular recognition, the roles of carbohydrate binding proteins; glycobiology of microbes, viruses and plants; glycobiology and disease; and glycans as renewable bio-energy sources. Antirequisite: BCH550. 1 Credit

MS8115 Organic Methodology
The course will focus on the investigation of total synthesis and retro-synthetic strategies. These techniques will be applied to determine the steps required to develop and appreciate complex organic structures. This course serves as a natural extension to the material delivered in most undergraduate organic chemistry curricula, therefore, it will further the understanding of synthetic problem solving and overall knowledge for organic reactions. 1 Credit

MS8116 Meta-analysis for Scientists
Graduate course providing students with the knowledge and skills to conduct basic research reviews and meta-analyses. Topics include: using meta-analysis to formulate and enact theory and science-based practices, procedures for executing reviews and meta-analyses, retrieving literature, coding studies, computing effect sizes and error, factors that affect precision, analytical models, heterogeneity, meta-regression, using complex data structures, power analysis, and publication bias. 1 Credit

MS8117 Molecular Ecology
This course will explore how molecular approaches and tools can be used in ecological, evolutionary, and environmental research. Through lectures and discussions, students will be exposed to cutting-edge biochemical techniques used in molecular ecology and examine how these enhance traditional ecological methods. Topics covered may include biological and chemical tracers, and various genetic tools. We will also consider various areas of practical application. 1 Credit

MS8201 Master's Seminar 1
This seminar course features presentations by guest speakers and students in the program. Each student is required to present a seminar on a topic not directly related to the student's thesis research. All program students are required to attend and to actively participate in all seminars provided in this course. Pass/Fail

MS8202 Master's Seminar 2
This seminar course features presentations by guest speakers and students in the program. Each student is required to present a seminar on his/her thesis research including background, proposal and results. All program students are required to attend and to actively participate in all seminars provided in this course. Pass/Fail

MS9201 PhD Seminar
This course features presentations by guest speakers and PhD students. All students are required to attend and actively participate in seminars every semester. Students will present one seminar on a topic relevant to their dissertation and one seminar on their dissertation, normally in their final year. Students will also participate on panels which will introduce and question the speakers. This

course aims to improve the communication skills of students. To facilitate this goal, student presentations will be assessed by attending faculty and the student panel. Pass/Fail

MS9210 Directed Studies Mol Sci PhD

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NURSING

CURRICULUM

Master of Nursing

DEGREE REQUIREMENTS		**Credits**
MN8901	Quantitative Research Methods	1
MN8902	Qualitative Research Methods	1
MN8903	Nature & Devel of Nurs Knowlge	1
AND one of the following options:		
	THESIS Option (available by permission only)	
MN8000	Master's Thesis	4
MN8904	Seminar: Adv Nurs Practice	1
MN8905	Practicum: Adv Nursing Practice	1
One course from either Field I Or Field II		1
	COURSE Option	
MN8904	Seminar: Adv Nurs Practice	1
MN8905	Practicum: Adv Nursing Practice	1
Students must complete two field courses from Field I or two field courses from Field II		2
Three elective credits		3
	NURSE PRACTITIONER Option	
MN8950	Major Research Paper	1
MN8951	Integrated Practicum	1
MN8955	Pathophysiology for PHCNP	1
MN8956	PHCNP Roles, Responsibilities	1
MN8957	Adv Hlth Assess, Diagnosis I	1
MN8958	Adv Hlth Assess, Diagnosis II	1
MN8959	Prim Hlth Care Therapeutics I	1
MN8960	Prim Hlth Care Therapeutics II	1
Field I - Leadership in Health Care Policy and Education		
MN8920	Hlth Policy: Compartv Analysis	1
MN8921	Leadership in Education	1
MN8934	Interprofessional Health Education	1
Field II - Health and Illness of Individuals and Communities		
MN8910	Health & Illness: Theoretc Pers	1
MN8911	Population Hlth & Hlth Promtn	1
MN8931	Divers & Glbztn: Urban Hlth	1

Electives		**Credits**
MN8930	Advanced Nursing Ethics	1
MN8931	Divers & Glbztn: Urban Hlth	1
MN8932	Nursing Informatics	1
MN8933	Selected topics in Nursing	1
MN8934	Interprofessional Health Education	1
MN8935	Thry Prac of Pgm Plan and Eval	1
MN8936	Adv Therapeutic Communication	1
MN8950	Major Research Paper	1

COURSE LISTING

MN8000 Thesis
Pass/Fail

MN8901 Quantitative Research Methods
Students will have the opportunity to explore and critique a variety of quantitative research methods utilized in the development of nursing science. They will study the different research designs, sampling strategies, data collection methods and statistical analyzes utilized when undertaking quantitative research studies. They will also discuss and critique research arising from a variety of practice settings that are conducive to quantitative methodologies. Frameworks and approaches to research utilization and evidence based practice will be discussed and students will explore strategies for translating results of quantitative research studies into practice settings. 1 Credit

MN8902 Qualitative Research Methods
This course will provide students with the opportunity to explore and critique a variety of qualitative research methods and approaches. Students will explore how the philosophical underpinnings of various research approaches inform the construction of research questions, selection of methods, and strategies for data analysis. Examples of qualitative research conducted in a variety of practice settings will be discussed and critiqued. Students will learn how qualitative and quantitative research methods can be used as either separate or complementary approaches in research design. 1 Credit

MN8903 Nature & Development of Nursing Knowledge
The students will explore the evolution of nursing theory and its accompanying philosophical foundations to understand the inter-relationship between theory, practice and research. In addition, they will examine the development and nature of nursing's scientific body of knowledge and the art of nursing. Students will be able to critically analyze a variety of nursing theories related to their use for nursing practice and research. Through the process of theory analysis and evaluation they will examine selected nursing conceptual models/theories from the totality and simultaneity paradigms, and examine the value of theoretical pluralism. 1 Credit

MN8904 Seminar in Professional Nursing Advancement
Students will analyze theoretical perspectives related to the advancement of professional nursing practice from a variety of philosophical and critical standpoints. Using case studies and examples from their practica, students will examine and synthesize linkages between theory, research, advanced practice, and their field of study. Students will explore and critique the multiple domains of professional nursing at an advanced level, including clinical practice, leadership, policy, education, and research. Co-requisite: MN8905. 1 Credit

MN8905 Practicum in Professional Nursing Advancement
Students will focus on the synthesis and application of knowledge at an advanced level within their chosen field of study. They will be expected to successfully apply knowledge gained from practice, theory and research into their advanced role during their practicum experience. Students will promote change and demonstrate innovation by extending the boundaries of nursing practice (e.g. contribute to knowledge development and the advancement of the profession). Co-requisite: MN8904. Pass/Fail

MN8910 Health & Illness: Theoretical Perspectives
Students will examine broad conceptualizations of health and illness to provide a foundation for critical analysis of specific conceptual models (such as health beliefs, loss, quality of life, and recovery) relevant to the experience of individuals and families across a variety of illness groups. This will enable students to develop an advanced understanding of current theoretical perspectives and research related to biopsychosocial and cultural determinants of health and illness. Students will also examine models of psychosocial intervention applicable to their professional practice that support health for individuals and families. 1 Credit

MN8911 Population Health & Health Promotion
Drawing upon critical theory, the social determinants of health, and social justice frameworks, students will engage in an analysis of major primary health care, health promotion, and population health initiatives locally, nationally, and globally. Links to social, cultural, environmental, political, and economic contexts that impact on health, equity, and health disparities will be analyzed critically. Evidence-based research and ethical considerations central to community health and advanced community health nursing practice will be examined. Emphasis throughout will be placed on upstream, participatory, and collaborative approaches to the development of healthy public policy locally and globally. 1 Credit

MN8920 Health Policy: A Comparative Analysis
This course will provide students with the opportunity to examine the development of health policy in Canada. Public policy analysis will be introduced in a way that provides an overview of techniques and issues that are applicable to an understanding of how health care policy evolves. Students will use these techniques to critically analyze current issues and trends in Canada's health care system as well as other selected countries. The action of key interest groups who influence public policies which ultimately shape health priorities and goals will be examined with a particular focus on the role of the nursing profession, other professions and consumers. 1 Credit

MN8921 Leadership in Education
Students will examine the role of the advanced practice nurse in influencing the development and advancement of education in diverse professional practice environments. Students will develop advanced skills in the creation of a supportive learning/teaching environment respectful of the diversity of learners. Students will apply relevant theories and research to critique various approaches used in health education and health promotion. Students will examine strategies that facilitate the professional advancement of the educator in providing educational leadership within a variety of practice settings including, but not limited to, the community, hospitals and universities. 1 Credit

MN8930 Advanced Nursing Ethics
Students will examine ethical theory in health care and nursing, such as; Kantianism, virtue ethics, communitarianism, feminist bioethics, narrative ethics, principlism and casuistry. To demonstrate their understanding of theory and methods to conduct ethical analyzes, students will develop case studies arising from practice. Utilizing these case studies, students will be facilitators of their colleagues' learning through active and dynamic discussions and debates of key ethical issues relevant to advanced nursing practice. Students will be expected to synthesize the broader ethical concepts such as research ethics, organizational ethics and priority setting throughout these discussions and assignments. 1 Credit

MN8931 Diversity & Globalization: Urban Health
Using critical social theory as a framework, students will explore how urban health is impacted by factors related to diversity and globalization. Students will critically examine the intersections of the broad social determinants of health as influencing the experiences of individuals, families, and communities within urban environments. Students will investigate the impact of the health care system design and the various roles of health professionals on current urban health issues. Students will identify and critique a range of frameworks and strategies that can be utilized by advanced practice nurses in the community to engage individuals, families, and population groups in promoting urban health. 1 Credit

MN8932 Nursing Informatics
Students will explore the integration of nursing, health information and computer sciences. Issues, challenges, opportunities and evaluations of the management and communication of: 1) data; 2) information; and 3) knowledge in a variety of practice settings (including clinical, education, research and administration) will be examined and critiqued by students. Students will also critically examine the social, legal and ethical impact of informatics within nursing and the health care system. 1 Credit

MN8933 Selected Topics in Nursing
Students will study a topic of current interest selected by the Nursing faculty which may vary from year to year. This course consists of lectures, seminars, and readings covering the latest advances and research in nursing and health care such as: death and dying; and, therapeutic communication. The course descriptions for the selected topics will be announced prior to scheduling of the course. 1 Credit

MN8934 Interprofessional Health Education
This course provides students with an understanding of a range of pertinent issues related to interprofessional working and learning across a variety of health care settings. The course will explore a number of theories and factors (e.g. professionalism, gender, ethnicity) related to interprofessional education and practice. The course also examines professional roles, responsibilities and scopes of practice as well as salient legal and ethical issues related to working together in a collaborative manner. 1 Credit

MN8935 Theory and Practice of Prgm Plan and Eval
Health care professionals are responsible for designing, implementing, and evaluating programs targeting patients, staff, or care delivery. This course prepares students to assume this responsibility by providing 5heoretical knowledge and practical skills for planning a program, monitoring its implementation, and evaluating its impact on outcomes. This course focuses on strategies for designing a program, for planning and monitoring a program implementation, and for evaluating the effectiveness of a program in achieving the desired outcomes. 1 Credit

MN 8936: Advanced Therapeutic Communication: An Inter-professional Perspective
Conceptualizations of advanced therapeutic communication with clients from an inter-professional perspective will be critically examined. The significant role of reflective processes necessary for collaborative therapeutic relationships with persons in our care, as well as the contextual factors that impact therapeutic communication, such as personal and cultural background, diversity and the role of the inter-professional team, will be considered. Various approaches to advanced therapeutic communication will be explored. 1 Credit.

MN8950 Major Research Paper
The Major Research Paper (MRP) provides students with an opportunity for critical and analytic reflection on a substantive topic of relevance to nursing and their specific practice interests. Through this scholarly work students will demonstrate in-depth knowledge of and integrative, analytic thinking on the chosen topic. Weekly student-led and professor facilitated seminars provide a forum to explore various methodological approaches to appraising and synthesizing knowledge, as well as considering strategies for applying and evaluating knowledge. Corequisite: MN8901, MN8902, MN8903. 1 Credit

MN8951 Integrative Practicum
Students synthesize and integrate knowledge of research, theory, philosophy, ethics, clinical care, education and leadership to provide primary health care to diverse populations across the lifespan. Demonstrate autonomy in decision-making and the critical analysis of organizational and system issues that influence scope of practice and professional accountability. Corequisite: MN8901, MN8902, MN8903, MN8950, MN8956, MN8957. MN8958, MN8959, MN8960. Antirequisite: APN951. 1 Credit

MN8955 Pathophysiology for PHCNP
Students examine theoretical and practice related concepts in pathophysiology as a basis for advanced nursing practice. Students explore alterations in physiological function with an emphasis on age-related, acute, episodic, and chronic conditions found in primary health care practice. Corequisite: MN8901, MN8902, MN8903. Antirequisite: APN955. 1 Credit

MN8956 PHCNP Roles, Responsibilities
Students 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. Students critically analyze and develop strategies to implement advanced practice nursing competencies with a focus on the community. Corequisite: MN8901, MN8902, MN8903. 1 Credit

MN8957 Adv Hlth Assess, Diagnosis I
Students analyze and critique concepts and frameworks essential to advanced health assessment and diagnosis using clinical reasoning skills. They apply clinical, theoretical and research knowledge in a comprehensive and focused health assessment for the individual client's diagnostic plan of care. Corequisite: MN8901, MN8902, MN8903, MN8955. Antirequisite: APN957. 1 Credit

MN8958 Adv Hlth Assess, Diagnosis II
Students integrate knowledge and apply conceptual frameworks integral to advanced health assessment and diagnosis in advanced nursing practice. Students demonstrate initiative, responsibility, and accountability in complex decision making for individuals, groups, and/or families within the nurse practitioner scope of practice based on current research findings. Corequisite: MN8901, MN8902, MN8903, MN8955. Antirequisite: APN958. 1 Credit

MN8959 Prim Hlth Care Therapeutics I
Students critically appraise and interpret concepts and frameworks integral to pharmacotherapy, advanced counseling, and complementary therapies for common conditions across the lifespan. Students develop, initiate, manage, and evaluate therapeutics plans of care that incorporate client values and acceptability, goals of therapy, analysis of different approaches, pharmacotherapeutic principles. Corequisite: MN8901, MN8902, MN8903, MN8957. Antirequisite: APN959. 1 Credit

MN8960 Prim Hlth Care Therapeutics II
Students integrate conceptual frameworks and evidence underlying the study of pharmacotherapy, advanced counseling, and complementary therapies for complex client situations. Students demonstrate substantive initiative, responsibility, and accountability in complex decision making. Corequisite: MN8901, MN8902, MN8903, MN8957. MN8958, MN8959. Antirequisite: APN960. 1 Credit

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NUTRITION COMMUNICATION

CURRICULUM

Professional Master's Diploma

DIPLOMA REQUIREMENTS

	PMDip Dietetics	**Credits**
NC8300	Population Health Promotion	1
NC8401	Practicum Unit I	1
NC8402	Practicum Unit II	1
NC8403	Practicum Unit III	1

Master of Health Science

DEGREE REQUIREMENTS

First Offered Fall 2007		**Credits**
NC8101	Appraising Scientific Evidence	1
NC8102	Individual Health Behaviour	1
NC8103	Nutrition Communication Strategies	1
NC8104	Dietetic Practice Seminar	1
NC8201	Food and Nutrition Policy	1
NC8209	Knowledge Translation	1

AND one of the following Options:

MAJOR RESEARCH PAPER Option:

Major Research Paper/Project		(Milestone)
NC8205	Directed Studies	1

ACCREDITED PRACTICUM Option: *(first offered Fall 2013)**

NC8300	Population Health Promotion	1
NC8301	Practicum Seminar I	1
NC8302	Practicum Seminar II	1

* This option requires enrollment in an additional term for the second practicum (NC8302)

COURSE LISTING

Major Research Paper/Project
The major research paper/project is an opportunity for students to independently investigate a particular issue or application in nutrition communication. It may be a development/testing of a nutrition communication technique or a multi-media product; an analytic project, such as a comprehensive literature review, policy or secondary data analysis. Students are required to develop a project plan for approval early in the Fall term and submit their final report at the end of the Spring/Summer term. This is a "Milestone". Pass/Fail

Practicum I Placement 1
Students will undertake placement(s) in various dietetic practice areas to enable them to demonstrate professional competencies required for entry level practice as Registered Dietitians and apply theoretical knowledge in professional/practical settings.
Students will be required to submit self-assessments during their placement(s). This is a "Milestone" and is pass/fail. Department consent is required to enroll. Prerequisite: Successful completion of all required MHSc courses NC8101, NC8102, NC8103, NC8104A/B, NC8201,NC8209, NC8300

Practicum I Placement 2
Students will undertake placement(s) in various dietetic practice areas to enable them to demonstrate professional competencies required for entry level practice as Registered Dietitians and apply theoretical knowledge in professional/practical settings. Students will be required to submit self-assessments during their placement(s). This is a "Milestone" and is pass/fail. Department consent is required to enroll. Prerequisite: Practicum 1 Placement 1

Practicum II Placement 1
Students will undertake placement(s) in various dietetic practice areas to enable them to demonstrate professional competencies

required for entry level practice as Registered Dietitians and apply theoretical knowledge in professional/practical settings. Students will be required to submit self-assessments during their placement(s). This is a “Milestone” and is pass/fail. Department consent is required to enroll. Prerequisite: Practicum I Placement 2

Practicum II Placement 2

Students will undertake placement(s) in various dietetic practice areas to enable them to demonstrate professional competencies required for entry level practice as Registered Dietitians and apply theoretical knowledge in professional/practical settings. Students will be required to submit self-assessments during their placement(s). This is a “Milestone” and is pass/fail. Department consent is required to enroll. Prerequisite: Practicum II Placement 1

NC8101 Appraising Scientific Evidence

Emphasis will be placed on understanding how to evaluate and interpret research to make informed judgements regarding complex nutrition issues. Students will learn to interpret the tools used by scientists to measure the impact of interventions and scientific outcomes from a variety of research approaches and study designs. Students will learn how to synthesize knowledge and formulate an evidence-based position on a complex nutrition issue by conducting a systematic literature review. 1 Credit

NC8102 INDIVIDUAL HEALTH BEHAVIOUR

This course explores theories and constructs related to health behaviour, behavioural determinants, and behavioural change in individuals. Students will develop an understanding of biological and psychosocial processes that support or impede an individual’s health and effective communication tools that promote health. Students will engage in workshops, discussions, activities, and simulations, designed to increase their readiness for dietetic competency attainment in their practicums. 1 Credit

NC8103 Nutrition Communication Strategies

Principles and strategies for adult education, online, and social media communication are examined and applied. Evidence and strategies for evaluating the effectiveness of online communication for health promotion are critiqued. A flexible learning approach enables students to apply communication best practices using varied channels and vehicles. Media training workshops enhance students’ skills and engage them in formulating key messages, simulations, and offering constructive peer feedback. 1 Credit

NC8104 Dietetic Practice Seminar

A flexible, application-focused approach engages students in self-reflection and self-development practices to support their growth as dietetic professionals. Students create and implement professional development plans and apply pathophysiology and nutrition knowledge to create evidence-based nutrition care plans in case studies and clinical simulations. Communication projects enhance inclusive, accessible communication skills and utilize principles of universal instructional design.1 Credit

NC8201 Food and Nutrition Policy

This course provides an overview of contemporary food and nutrition policy issues and debates. The policy development process and roles and perspectives of multiple stakeholders are explored through examinations of current policy issues. Students will develop their ability to critically examine and communicate policy issues and debates to stakeholders as food and nutrition subject matter experts. 1 Credit

NC8205 Directed Studies

Students arrange to work with an individual faculty member on a course designed to pursue readings in a specific area that is relevant to nutrition communication. 1 Credit

NC8209 Knowledge Translation

This course aims to increase students’ understanding of the principles of knowledge translation. Emphasis will be placed on critical appraisal of studies including systematic literature reviews and clinical practice guidelines; and synthesis, interpretation, and communication of research results to the public and professional audiences. 1 Credit

NC8210 Directed Studies II

Students arrange to work with an individual faculty member on a course designed to pursue readings in a specific area that is relevant to dietetics. 1 Credit

NC8300 POPULATION HEALTH PROMOTION

This course provides students with opportunities to meet all population and public health competencies. Students will explore diverse dietetics roles and responsibilities in population health settings through guest speakers, assignments and an immersive community engagement capstone project. In groups, students will conduct a needs assessment, develop a nutrition focused plan, implement and evaluate their plan with the overarching goal of promoting the nutritional health of a group, community or population. 1 Credit

NC8301 Practicum Seminar I

The non-credit seminar supports students as they engage in full-time practicum placements. An orientation and additional workshops using case-based learning and online modules helps students to consolidate learning, identify strategies to resolve problems, and demonstrate a collegial approach to professional practice. The placements will be recorded and evaluated in two milestones and students are required to successfully complete both to pass the course. 1 Credit

NC8302 Practicum Seminar II

Building on Practicum Seminar 1, the non-credit seminar supports students as they engage in full-time practicum placements. Workshops using case-based learning and online modules helps students to consolidate learning, identify strategies to resolve problems, and demonstrate a collegial approach to professional practice. The placements will be recorded and evaluated in two milestones and students are required to successfully complete both to pass the course. Prerequisite: NC8301

NC8401 Practicum Unit I
Based on the progressive model of competency attainment, this course provides students with structured experiences to build on their previous experiential learning by adding depth and breadth to their learning. Students will integrate knowledge and skills while demonstrating their competence as defined by the Integrated Competencies for Dietetic Education and Practice. Pass/Fail 1 Credit

NC8402 Practicum Unit II
Based on the progressive model of competency attainment, this course provides students with structured experiences to build on their previous experiential learning by adding depth and breadth to their learning. Students will integrate knowledge and skills while demonstrating their competence as defined by the Integrated Competencies for Dietetic Education and Practice. Pass/Fail 1 Credit

NC8403 Practicum Unit III
Based on the progressive model of competency attainment, this course provides students with structured experiences to build on their previous experiential learning by adding depth and breadth to their learning. Students will integrate knowledge and skills while demonstrating their competence as defined by the Integrated Competencies for Dietetic Education and Practice. Pass/Fail 1 Credit

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OCCUPATIONAL AND PUBLIC HEALTH

CURRICULUM
First Offered Fall 2022

Master of Science

DEGREE REQUIREMENTS		Credits
Thesis		(Milestone)
OH8001	Research Methods and Study Design	1
OH8002	Evidence-Based Prevention	1
OH8003	Data Analysis for Research	1
OH8004	Knowledge Synthesis	1
OH8005	Seminar Series I	Pass/Fail
OH8006	Seminar Series II	Pass/Fail
Two Electives		2

ELECTIVES		Credits
OH8210	Epidemiology for Public Health	1
OH8211	Hazard Assessment	1
OH8212	Special Topics	1
OH8213	Directed Studies	1

COURSE LISTING

Thesis
Students will conduct a research thesis relevant to occupational and public health under the supervision of a faculty member and supervisory committee. Students will identify and finalize their thesis topic by the end of their first semester, as part of the coursework requirements of the seminar series course (OH8005). Their thesis proposal must be finalized by the end of their second semester (full-time students) or fifth semester (part-time students). This is a Milestone.

OH8001 Research Methods and Study Design
This course will provide the methodological foundation for interdisciplinary research in occupational and public health. Students will learn to select appropriate study designs for their topic of interest. Both experimental and observational study designs will be discussed, with particular attention to minimizing biases and confounding in occupational and public health research. Reviewing the literature to develop a research question as well as rigorous designs for data collection instruments, including questionnaires, will be emphasized. Additional topics will involve critical appraisal and research ethics. 1 Credit.

OH8002 Evidence-Based Prevention
This course will introduce students to a range of occupational and public health problems, with particular emphasis on problems that intersect both domains. The course will explore ways in which scientific analysis and management concepts and approaches can be applied to developing effective and collaborative evidence-based prevention approaches. Academic and professional experts will present research and case studies on current and emerging topics. Students will develop and apply a collaborative and multidisciplinary approach to solving occupational or public health issues. 1 Credit.

OH8003 Data Analysis for Research
This course will build on standard undergraduate coursework in statistics to provide a foundation for advanced data analysis methods used in occupational and public health research. Topics will include ANOVA methods for complex experimental designs, multiple linear regression, logistic regression, and survival analysis. Students will be provided hands-on experiential learning using statistical software packages and publicly available occupational and public health datasets. 1 Credit.

OH8004 Knowledge Synthesis
In this course a program of supervised, advanced study related to the student's area of interest/thesis topic will be identified by the supervisory committee. The supervisor, a faculty member who is a disciplinary expert will oversee the directed study of a specific domain or discipline of occupational and public health. Definition of the primary research thesis question and research proposal are the final course deliverables. 1 Credit.

OH8005 Seminar Series I
This course will provide students with foundational knowledge to develop a research question and thesis proposal. This includes critique of the literature, writing skills and presentation tips. Each student will present their research question and topic via oral and poster presentation. Pass/Fail

OH8006 Seminar Series II
This course will provide students with an understanding of the oral defense process, knowledge dissemination and guidance with respect to career planning. Students will also learn about relevant professional and research groups, networking and how to increase their individual profile. Each student will present their thesis research via oral and poster presentation. Pass/Fail

OH8210 Epidemiology for Public Health
This course will provide foundations of epidemiological methods for analysis of population and public health data. Students will use example data from case-control, longitudinal and cross-sectional studies to develop and test hypotheses. Methods unique to injury, chronic disease and infectious disease epidemiology will be explored. 1 Credit.

OH8211 Hazard Assessment
This course will explore the methods used in assessing occupational health and safety hazards. Approaches used to assess physical agent, chemical and biological hazards for research purposes will be explored. 1 Credit.

OH8212 Special Topics
This course examines selected topics of occupational and public health that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of students and the instructor. The course description will be announced prior to scheduling of the course. 1 Credit.

OH8213 Directed Studies
This course allows individual directed study of subject areas not addressed in the current curriculum. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with a supervising faculty member. 1 Credit.

Electives from other YSGS graduate programs, particularly Spatial Analysis, Environmental Applied Science and Management, Nursing, and Mechanical and Industrial Engineering may be taken **with the approval of the supervisor and program**.

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PHILOSOPHY

CURRICULUM
First Offered Fall 2010

Master of Arts

DEGREE REQUIREMENTS		**Credits**
PH8001	Area Readings	1
PH8003	Professional Seminar	1
AND one of the following Options:		
THESIS Option		
	Master's Thesis	(Milestone)
	And Five Elective credits with at least one from three of the four core areas below	5
MAJOR RESEARCH PAPER Option		
	Major Research Paper	(Milestone)
	And Seven Elective credits with at least one from three of the four core areas below	7

Electives		**Credits**
Core Area:	**CONTINENTAL PHILOSOPHY**	
PH8119	Phenomenology and Existentialism	1
PH8121	Recent Continental Philosophy	1
PH8125	Critical Theory	1
PH8128	Contemporary Political Thought	1
Core Area:	**HISTORY OF PHILOSOPHY**	
PH8115	Ancient Philosophy	1
PH8116	Topics in Early Modern Philosophy	1
PH8117	19th Century Philosophy	1
PH8126	Kant	1
PH8131	Topics in Ancient Philosophy	1
PH8130	South Asian Philosophy	1
Core Area:	**METAPHYSICS AND EPISTEMOLOGY**	
PH8101	Epistemology	1
PH8102	Metaphysics	1
PH8104	Philosophy of Religion	1
PH8105	Philosophy of Language	1
PH8106	Philosophy of Mind	1
PH8108	Philosophy of Action	1
Core Area:	**VALUE THEORY**	
PH8107	Human Rights and Justice	1
PH8109	Moral Philosophy	1
PH8110	Aesthetics	1
PH8111	Social and Political Philosophy	1
PH8112	Feminist Philosophy	1
PH8129	Metaethics	1
PH8132	Indigenous Philosophy	1
Unclassified – to be assigned to a core area according to content at time of enrollment		
PH8122	Topics in Philosophy	1
PH8123	Major Figures in Philosophy	1

COURSE LISTING

Major Research Paper
A Major Research Paper is a work of about 35-40-pages written under the supervision of a faculty member. The standard of evaluation is an article in a refereed academic journal. This is a Milestone. Pass/Fail

Thesis
A Thesis is a work of about 100-120 pages written under the supervision of a thesis committee. The standard of evaluation is a short monograph published by an academic press. This is a Milestone. Pass/Fail

PH8001 Area Readings
The Area Readings course consists of independent but guided research in a core area of philosophy chosen by the student in consultation with the program director. The Area Readings course is an opportunity for students to broaden their philosophical knowledge while sharpening their research skills. The course culminates in a written and/or oral exam. Students will typically conduct the Area Readings in the area of their eventual Thesis or MRP. Pass/Fail

PH8003 Professional Seminar
The Professional Seminar is a required course for all first year students. While the topics may vary from year to year, the seminar aims to introduce students to the professional skills needed to succeed in the program and the profession. Students will meet the department's faculty, who will present their research and discuss the methods they employ and the distinctive traditions in which they work. Finally, the seminar will initiate the mentoring and planning processes needed to successfully complete the program, including grant and scholarship applications. Pass/Fail

PH8101 Epistemology
This course is a study of what canonical and contemporary philosophers have said about several central problems in the theory of knowledge. Topics may include: theories of justification; skepticism; the limits of belief and knowledge; perception, intuition and other sources of evidence; the social construction of knowledge; science and pseudo-science; a priori and a posteriori knowledge; knowledge of mathematical truths. 1 Credit

PH 8102 Metaphysics
This course is a study of what canonical and contemporary philosophers have said about several central metaphysical problems. Topics may include: being and existence; the existence and nature of abstract objects; modality and possible worlds; the nature of time; personal identity; and metaphysical realism and anti-realism. 1 Credit

PH8104 Philosophy of Religion
This course is a study of what canonical and contemporary philosophers have said about religion. Topics may include: concepts of God and ultimate reality; arguments for and against the existence of God; the relationship between faith and reason; religious diversity; miracles; religion and science; religion and ethics. 1 Credit

PH8105 Philosophy of Language
This course will examine philosophical issues regarding both the nature of language and the relation of language to other matters. The first group of issues includes topics such as: what distinguishes linguistic communication from other types of communication; how metaphors work; the ways in which language is rule-governed; the distinction between semantics and pragmatics. The second group of issues includes topics such as: the relation between language and thought, between language and truth, language and rationality, and language and gender. 1 Credit

PH8106 Philosophy of Mind
This course will examine a selection of views and issues that have arisen out of philosophical attempts to make sense of "the mind". Some of these views may be historical, while others will be contemporary. Issues taken up may include: mind-body dualism and its critics; materialism and its critics; behaviourism and its critics; the nature of sensory experience and its relation to thought; mind/ brain identity theories; the relation(s) between thought and language; functionalism and its critics; the nature of consciousness; the possibility of "naturalizing" the mind; whether non-human animals have thoughts; whether computers do, or could in principle, think; emotions and their expression; innatist accounts of learning; cognition as information processing. 1 Credit

PH8107 Human Rights and Justice
This course will explore a core theme in the general cluster of Philosophy of Human Rights, Law and Punishment. Examples include: transformations in philosophical theories of human rights, from Lockean Natural Rights theory to contemporary Egalitarianism (including Capability Theory and Feminist Theories); transformations in philosophical theories of punishment, revisioning deterrence, retributivism and restorative justice; transformations in philosophical theories of distributive justice (including Libertarianism, Rawls' Theory and other Egalitarian theories). 1 Credit

PH8108 Philosophy of Action
This course is a study of what historical and contemporary philosophers have said about several central problems concerning the nature of action. The course may include such topics as: free will and moral responsibility; the nature of agency; practical knowledge; the nature of intention and motivation; rationality and irrationality in action. 1 Credit

PH8109 Moral Philosophy
This course focuses on selected issues or figures in historical and/or contemporary moral philosophy. Typical topics to be dealt with might include: the sources of normativity; the metaphysical and epistemological underpinnings of moral experience; moral psychology

and the nature of practical reason; the relation between morality and politics and/or religion; particular moral theories such as utilitarianism, Kantianism, virtue ethics, and contractarianism. 1 Credit

PH8110 Aesthetics
This course will involve a close study of some central issues in philosophical aesthetics. Topics may be drawn from one or more of the main fields within the discipline: the study of beauty (or the aesthetic), the philosophy of art, and the philosophy of criticism. Potential topics include: the nature of art; the relation between morality and art, the character of aesthetic experience, and the appropriate criteria for art criticism. 1 Credit

PH8111 Social and Political Philosophy
This course focuses on selected issues or figures in historical and/or contemporary social and political philosophy. Typical topics to be dealt with might include: the scope and justification of the state; the right vs. the good; multiculturalism and group rights; the relation between economics, ideology and politics; particular political theories such as libertarianism, liberalism, political realism, communitarianism, critical theory. 1 Credit

PH8112 Feminist Philosophy
This course involves a close study of one or more philosophical topics in historical and/or contemporary feminist thought. Examples include: the nature and origins of gendered identity; feminist approaches to ethics; feminist epistemology; feminist perspectives on motherhood, sexuality, the body, and reproductive technology; critical approaches to gender-based oppression. 1 Credit

PH8115 Ancient Philosophy
This course involves a critical study of selected themes and doctrines in ancient Greek philosophy, with a focus on such seminal thinkers as Socrates, Plato, and/or Aristotle. Typical issues include: the nature of reality; the relation between universals and particulars; the nature of the soul and its relation to the body; the difference between knowledge and true belief, and between the different kinds of knowledge (philosophical, practical, mathematical, knowledge of the natural world); the nature of the good life and of virtue; the roles that reason, emotions, and appetites play in the virtuous person; the kinds of social, economic, and political structures that characterize the best society. 1 Credit

PH8116 Topics in Early Modern Philosophy
This course involves the critical examination of selected works from one or more of such major 17th and 18th Century philosophers as Descartes, Locke, Berkeley, Leibniz, Spinoza, Hume and Kant. Topics might include the structure, scope and limits of human knowledge; the primary secondary quality distinction; concepts of space, time and matter; nature of causation; nature of perception, consciousness and self-consciousness; personal identity; how mind and body are related; nature and existence of free will and the problem of evil and theodicy; the nature and foundations of moral and political rights. 1 Credit

PH8117 19th Century Philosophy
This course involves the critical examination of selected works from one or more of such major 19th Century philosophers as Fichte, Schelling, Hegel, Marx, Nietzsche and Kierkegaard. Typical themes to be addressed include: the nature of subjectivity and self-consciousness; the role that socioeconomic institutions play in shaping human knowledge and self-identity; the nature of reason and its relation to history; social dimensions of freedom; arguments for and against the systematic character of human knowledge; the critique of modernity. 1 Credit

PH8119 Phenomenology and Existentialism
This course is an in-depth study of the influential philosophical movement known as phenomenology, and of the ways this movement was taken up and developed by the existentialists of the Twentieth Century. Some of the typical issues to be studied include: the distinction between reflective and lived experience; the character of perception and embodied experience; the intersubjective constitution of the world's meaning; the breakdown of the subject/object dualism; the temporal structure of human reality; the significance of our encounter with death and nothingness. The main authors to be studied may include Husserl, Bergson, Heidegger, Sartre and Merleau-Ponty. 1 Credit

PH8121 Recent Continental Philosophy
This seminar examines a selection of the most important themes and developments in recent continental philosophy. Some of the topics to be examined may include: difference and alterity; the 'ethical turn'; desire and the unconscious; critiques of subjectivity and self-identity; communicative action theory; bio-politics; performativity. The course will typically focus on the work of such philosophers as Foucault, Deleuze, Habermas, Irigaray, Kristeva, Levinas, Lyotard, Nancy, Butler and Žižek. 1 Credit

PH8122 Topics in Philosophy
This course gives students the opportunity to engage in a rigorous and concentrated study of a specific canonical or contemporary philosophical topic. 1 Credit

PH8123 Major Figures in Philosophy
This course gives students the opportunity to engage in a rigorous and concentrated study of the work of a major historical or contemporary philosopher. 1 Credit

PH8124 Independent Readings
This course consists of focused study in an area of philosophy under the supervision of a faculty member. Students wishing to pursue an Independent Readings elective must submit a proposal of study, approved by the course supervisor, to the Program Director: the content of an Independent Readings course cannot overlap with a student's coursework, ARE, or final project studies. All Independent Readings are subject to Program Director's approval. 1 Credit

PH8125 Critical Theory
This seminar focuses on a branch of continental social and political thought known as Critical Theory. Though diverse, Critical Theorists share roots in Western Marxism and a commitment to the critique of ideologies and social practices that perpetuate alienation and oppression. Thinkers studied may include early forerunners, such as Marx, Nietzsche and Freud, members of

the Frankfurt School, including Horkheimer, Adorno, Marcuse and Fromm, and contemporary figures, such as Habermas and Honneth. 1 Credit

PH8126 Kant
This course studies the philosophical thought of Immanuel Kant as presented in works such as the *Critique of Pure Reason*, the *Groundwork to the Metaphysics of Morals*, the *Critique of Practical Reason*, and the *Critique of Judgment*. Topics to be discussed may include a priori knowledge, idealism, perception, and causation; free will, moral obligation, and practical reason; beauty, aesthetic judgment, and artistic genius; or teleological explanation, organisms, and the philosophy of biology. 1 Credit

PH8128 Contemporary Political Thought
This seminar explores 20th-21st C. political ideas by thinkers working within (or in relation to) the continental tradition who seek to understand the crises of their times. Themes might include colonialism, fascism, identity, migration, populism, racism, resistance, technocapitalism, totalitarianism, or violence. Texts will include European and non-European authors such as Appiah, Arendt, Balibar, Berardi, Chatterjee, Esposito, Fanon, Luxemburg, Mbembe, Samaddar and Weil. 1 Credit

PH8129 Metaethics
This course explores the metaphysics, semantics, and epistemology of morality. Possible questions may include: Are there moral facts and, if so, are they relative to individuals or society? Or, might morality somehow be objective? Can moral statements be true or false, or is moral discourse a matter of expressing our emotions? Is it possible for us to know anything about morality and, if so, how do we accomplish this? Through reason? Emotion? Intuition? 1 Credit

PH8130 South Asian Philosophy
This seminar is devoted to classical and medieval South Asian philosophy. Important figures studied may include Nāgārjuna, Īśvarakṛṣṇa, Pakṣilasvāmin Vātsyāyāna, Buddhaghosa, Candrakīrti, Kumārila Bhaṭṭa, Śāntarakṣita, Ādi Śaṅkara, Utapaladeva, and Rāmānuja. Thematically speaking, we will explore South Asian philosophical debates concerning, for instance, personal identity, ontology, epistemology, philosophy of language, the nature of insight, and how these themes relate to the ethical quest for liberation from delusion and the sufferings that emerge in its wake. 1 Credit

PH8131 Topics in Ancient Philosophy
This course involves a focused study of a particular topic in ancient philosophy, and may include, for instance, ancient women thinkers, Pre-Socratics, Hellenistic thinkers, and Neo-Platonists. 1 Credit

PH8132 Indigenous Philosophy
This course will examine key issues in Indigenous thought and include both traditional knowledges and contemporary theory and philosophy. Issues covered may include Indigenous feminism, the politics of the land back movement, Indigenous thinking on the environment, spirituality, decolonial thought, and language preservation and revitalization. Students will also learn about the ethical research practices and methodologies in Indigenous research. 1 Credit.

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PHOTOGRAPHY PRESERVATION AND COLLECTIONS MANAGEMENT

See **FILM and PHOTOGRAPHY PRESERVATION AND COLLECTIONS MANAGEMENT**

PHYSICS (from 2020)
Formerly Biomedical Physics

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		Milestone
BP8201	Master's Seminar I	Pass/Fail
BP8202	Master's Seminar II	Pass/Fail

PLUS the requirements of ONE of the following fields

BIOMEDICAL PHYSICS

BP8103	Fundamentals of Radiation Physics	1
	OR	
BP8115	Medical Imaging	1
Three elective credits from the Electives List with a minimum of 2 credits from Table A		3

CAMPEP MEDICAL PHYSICS

BP8115	Medical Imaging	1
BP8103	Fundamentals of Radiation Physics	1
BP8104	Radiation Therapy	1
BP8107	Radiation Protection and Dosimetry	1
BP8112	Radiobiology	1
BP8114	Anatomy and Physiology for Medical Physicists	1
AND as required to meet CAMPEP accreditation requirements		
	CAMPEP – Clinical Shadowing	Milestone
	CAMPEP – Radiobiology Bridge	Milestone

COMPLEX SYSTEMS

BP8116	Many-body Theory	1
BP8117	Dynamical Systems	1
BP8118	Complex Networks & Applications	1
One elective credit from the Electives List from either Table A or B		1

With permission, MSc Complex Systems students may replace a required course with a course from Table C

Doctor of Philosophy

DEGREE REQUIREMENTS		
Doctoral Candidacy Examination		Milestone
Doctoral Dissertation		Milestone
BP9101	Science Communication	1
BP9201	Doctoral Seminar I	Pass/Fail
BP9202	Doctoral Seminar II	Pass/Fail
BP9203	Doctoral Seminar III	Pass/Fail
BP9204	Doctoral Seminar IV	Pass/Fail

PLUS the requirements of ONE of the following fields

BIOMEDICAL PHYSICS

Two elective credits from the Electives List from either Table A or B	2
If deemed necessary to ensure an adequate background in Biomedical Physics, a student may be required to take either BP8115 or BP8103	1

CAMPEP MEDICAL PHYSICS

Any or All of the following courses not previously taken in the MSc program

BP8115	Medical Imaging	1
BP8103	Fundamentals of Radiation Physics	1
BP8104	Radiation Therapy	1
BP8107	Radiation Protection and Dosimetry	1
BP8112	Radiobiology	1
BP8114	Anatomy and Physiology for Medical Physicists	1

AND as required to meet CAMPEP accreditation requirements

	CAMPEP – Clinical Shadowing	Milestone
	CAMPEP – Radiobiology Bridge	Milestone

COMPLEX SYSTEMS

Two elective credits from the Electives List either Table A or B 2

If deemed necessary to ensure an adequate background in Complex Systems, a student may be required to take up to three of the required courses in the MSc – Complex Systems (BP8116, BP8117, BP8118) 1-3

Elective List		**Credits**
Table A		
BP8103	Fundamentals of Radiation Physics	1
BP8104	Radiation Therapy	1
BP8105	Comp Modeling in Biomed Phys	1
BP8107	Radiation Protection and Dosimetry	1
BP8110	Biomedical Ultrasound	1
BP8115	Medical Imaging	1
BP8116	Many-body Theory	1
BP8117	Dynamical Systems	1
BP8119	Bioclinical Optics and Biophotonics	1
Table B		
BP8101	Stats for the Health Sciences	1
BP8108	Special Topics I	1
BP8109	Special Topics II	1
BP8112	Radiobiology	1
BP8114	Anatomy and Physiology for Med. Phys.	1
BP8118	Complex Networks & Applications	1
Table C DS8015	Machine Learning non Data Science Students	1
CP8210	Topics in Data Science	1
CP8318	Machine Learning	1

Note: with permission from Supervisor and Program Director, Master's and PhD students may use one graduate course from a relevant program in place of one elective credit from Table B.

COURSE LISTING

Doctoral Candidacy Examination

The aim of the candidacy exam is to assess the originality and appropriateness of the proposed research, its relevance to the program, and the students' ability to complete the research and the program. The exam consists of a written and oral component. This is a "Milestone."

Doctoral Dissertation:

Students are required to conduct advanced research in the area of Physics. A specific research topic must be chosen in consultation with the student's supervisor(s) and with advice from the supervisory committee. The student will conduct the research under the direction of the supervisor(s) with guidance from the supervisory committee. In order to complete the course, the student must, upon approval from the supervisory committee, submit a written dissertation to an examination committee, and make an oral presentation and defence of the dissertation to this committee. Through the dissertation, the student must demonstrate an original contribution of new knowledge to the field of research, competence in research and a deep understanding of knowledge in the area of research. This is a "Milestone."

Master's Thesis
This a laboratory-based research project. Students are required to conduct research, submit their completed research in a thesis format to an examination committee, and make an oral presentation and defence of the research thesis and results to this committee. Through the thesis, students are expected to demonstrate competence in oral and written communication, experimental design and scientific thought processes, as well as a sound understanding of the specialty area associated with the research. This is a "Milestone."

CAMPEP -- Clinical Shadowing
Clinical shadowing is designed to give the Medical Physics Option students exposure to the clinical practice of Medical Physics. It is broken up into several components. Each component is supervised by a clinical medical physicist at a regional cancer centre. Students are responsible for contacting the responsible medical physicist to schedule a clinical shadowing session. The course will have a Pass/Fail grade, where a Pass will be assigned based on attendance and participation in all components. This is a "Milestone."

CAMPEP – Radiobiology Bridge
Students who took an anti-requisite of BP8112 will have to complete and pass any components in the CAMPEP accredited version that were missing from the anti-requisite course they took. Other students meet this milestone by virtue to taking BP8112. This is a "Milestone."

BP8101 Stats for the Health Sciences
This course is designed as a first course in biostatistics with emphasis on relevance in biomedical physics applications. Topics include nonparametric statistics, linear regression, errors and structural analysis of linear relationships between variables, nonlinear estimation, survival analysis and multivariate analysis of data. A statistics computer package will be used. 1 Credit

BP8103 Fndmntls of Radiation Physics
This course is designed for students with an undergraduate background in radiation physics. Topics include the Bohr atomic model, Rutherford scattering, emission of photons, x-ray spectra, Bremsstrahlung and characteristic radiation, homogeneous and heterogeneous photon beams, thin and thick x-ray targets, absorption and scatter of photon beams, beam attenuation, Thomson scattering, Photoelectric effect, Rayleigh scattering, Compton effect, pair production, interaction of neutrons with matter, radiation quantities and units, radiation decay, exposure, kerma, dose, and dose equivalent. 1 hour lab/week. 1 Credit

BP8104 Radiation Therapy
This course is an introduction to radiation therapy physics, including topics such as radiation teletherapy units; interaction of radiation with tissue; dosimetry of a single beam of x-ray; beam calibration and patient dose calculation; combination of beams and treatment planning, brachytherapy; radiation detection. Prerequisite: BP8103. 1 hour lab/week. 1 Credit

BP8105 Comp Modeling in Biomed Phys
The course will focus on the use of computational modeling techniques for hypothesis driven investigation of problems in biomedical physics. The student will apply and integrate fundamental knowledge of mathematics, physics and life sciences to design and implement appropriate models and to analyse and interpret simulation results. Emphasis will be placed on simulation methods such as Monte Carlo methods, and finite element and finite difference techniques. 1 Credit

BP8107 Rad Protection and Dosimetry
The course will focus on health physics, radiation safety and radiation protection (shielding). Students will learn the essentials of determining radiation doses from internal and external ionizing radiation sources. A survey of sources, applications, risks and control of environmental radiation will be presented. The final part of the course will review microdosimetry. Prerequisite BP8103 1 hour lab/week. 1 Credit.

BP8108 Special Topics I
This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The course description will be announced prior to scheduling the course. 1 Credit

BP8109 Special Topics II
This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The course description will be announced prior to scheduling the course. 1 Credit

BP8110 Biomedical Ultrasound
This course covers the essential elements in the physics of ultrasound and its current applications in medicine and biology. Topics include: physics of ultrasound, linear and non-linear ultrasound field calculations, scattering of ultrasound, ultrasound transducers, ultrasound imaging systems, Doppler ultrasound, and therapeutic ultrasound. Lec. 3 hrs/w, Lab. 1 hr/w 1 Credit

BP8112 Radiobiology Fundamentals of physics and chemistry of radiation interactions, free radicals, oxidation and reduction. Subcellular and cellular effects: killing, repair, sensitization and protection. Measurement methods. Survival curves and their

significance. Modification of the radiation response. Tissue effects, genetic and carcinogenic effects, mutations, hazards. Antirequisite: PCS354. 1 Credit

BP8114 Anatomy and Physiology for Med. Phys
An overview of the structure of the main regions of the human body including the thorax, abdomen, bones, brain and central nervous system. Function of respiratory, circulatory, nervous, digestive, urinary and reproductive systems. Anatomical nomenclature and a radiographic appearance of different body regions will be discussed. 1 Credit

BP8115 Medical Imaging
This course will cover the fundamentals of diagnostic medical imaging, including x-ray radiography, x-ray computed tomography (CT), magnetic resonance imaging, ultrasound, and nuclear medicine imaging. The mathematical models and image reconstruction methods will also be introduced.1 hour lab/week. Antirequisite: BP8113, BP8102. 1 Credit

BP8116 Many-body Theory
This course covers core topics in the study of systems with many degrees of freedom, including network models and out-of-equilibrium phenomena. Topics include a review of thermal equilibrium and partition functions, mean-field theory, Markov processes, the master equation, the Fokker–Planck equation, the Langevin approach, diffusion, random networks, percolation and epidemics, metastability and glassiness, disorder and replicas. 1 Credit.

BP8117 Dynamical Systems
This course is an introduction to the analytical and numerical study of systems whose state changes in time, with an emphasis on qualitative behaviour. Topics to be covered include phase space, invariant sets, linear stability, bifurcations, fractal geometry, and chaos. Concepts will be illustrated first with canonical nonlinear systems in low dimensions including the Henon map, Lorenz equations, Duffing oscillator, etc., to be augmented by numerical studies of high-dimensional nonlinear systems. Antirequisite: PCS800 1 Credit

BP8118 Complex Networks & Applications
An interdisciplinary introduction to the emerging science of networks and their applications to diverse fields. Topics to be covered include graph theory and topological measures, random network models, the scale-free and small-world properties, community detection, degree correlations, and applications to biology, sociology, technology, and other fields. Students will learn about ongoing research in the field, and ultimately demonstrate what they have learned in a final project in which they conduct a novel analysis of a network data-set of their choosing. Antirequisite: PCS 810 1 Credit.

BP8119 Bioclinical Optics and Biophotonics
This course is designed for learning basic applications of advanced optical technologies in biology and clinics including basics, advanced topics, and clinical/industrial project management skills. The course contains lectures and final individual presentation. 1 Credit

BP8201 Master's Seminar I
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the first year of the program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

BP8202 Master's Seminar II
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the second year of the program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

BP9101 Science Communication
The course is designed for students who are interested in pursuing an academic career as well as those intending to work outside the academic environment after graduating. Specific course goals are to provide graduate students with insight into, and practice in effective means of science communication as well as an awareness of ethical issues in research and professional environments. This will be done through various activities that include writing and reviewing research grant proposals, teaching physics mini-lessons, literature and presentation critiques, manuscript and thesis/dissertation preparation, and oral presentation for a range of audiences (scientist, media, lay audience, school children) and subjects (including research-related and more general topics). This course is suitable for students in other scientific or engineering disciplines. 1 Credit.

BP9201 Doctoral Seminar I
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the first year of the Doctoral Program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

BP9202 Doctoral Seminar II
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the second year of the Doctoral Program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

BP9203 Doctoral Seminar III
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the third year of the Doctoral Program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

BP9204 Doctoral Seminar IV
This course consists of weekly seminars with an emphasis on current research in the specialization fields and emerging areas of physics. This is a two-term course (Fall and Winter) in the fourth year of the Doctoral Program and is generally one hour per week. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Pass/Fail.

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POLICY STUDIES

CURRICULUM
First Offered Fall 2009

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Comprehensive Examination		(Milestone)
Dissertation		(Milestone)
PD9001	Policy Theories and Approaches	1
PD9002	Rsrch Fdns for Policy Studies	1
PD9004	Foundations of Quantitative Research	1
One in a related areas of interest		1
One Advanced Methods course		1
One foundation Course		1

FOUNDATION COURSES		Credits
PD9101	Public Policy and Admin	1
PD9102	Imm, Sett, and Diaspora Policies	1
PD9103	Social Policy	1

ADVANCED METHODS COURSES		Credits
SS8000	Stat Analysis in Social Science Research	1
SS8001	Advanced Qualitative Research	1

ELECTIVES*		Credits
CC8940	Poltc Econ of Cult and Commun	1
CC8941	Issues in Commun & Cult Policy	1
CC8946	Communication Policy	1
CC8947	Cultural Policy	1
CS8931	Children and Canadian Policies	1
EF8931	Internat Trade Theory, Policy	1
ES8921	Environmental Law	1
ES9001	Adv Studies in Envir Pol, Mgmt	1
IS8901	The Cdn Immigration Experience	1
IS8903	Imm Law Policy Politics Pract	1
IS8934	Multicult Cities–Planning Plcy	1
MN8920	Hlth Policy: Compartv Analysis	1
NC8201	Food and Nutrition Policy	1
PA8100	Public Admin & Governance	1
PA8102	The State & the Economy	1
PA8202	Comparative Public Policy	1
PA8204	Intergovernmental Relations	1
PD9000	Policy Analysis	1
PD9200	Directed Studies	1
SA8907	Health in Urban Environments	1
SA8911	Geodemographics	1
SK8207	Critical Social Policy	1
SS8000	Stat Analysis in Soc Sci Rsrch	1
SS8001	Advanced Qualitative Methods	1
SS8100	Urban Policy	1
SS8200	Justice Policy	1

*Other electives may be taken with the permission of the Program Director

COURSE LISTING

Comprehensive Examination
Doctoral Candidates must complete the comprehensive requirement to demonstrate a comprehensive understanding of the state of knowledge in their field in the broader context of policy studies. This includes central themes and major debates, the key theoretical and methodological foundations and challenges in their field and policy studies. The comprehensive requirement is based on the core theory and research foundations courses, and the candidate's required field foundation course. Successful completion of the requirement indicates that the student has the level of knowledge needed to begin work on the dissertation. Normally this must be completed by the end of the second year of registration. Pass/Fail. This is a Milestone.

Dissertation
The doctoral dissertation requires the candidate to produce a substantial piece of supervised work that is worthy of publication and that makes an original contribution to knowledge in the field of Public Policy. Interaction between a graduate student and his or her doctoral advisor is also an important cornerstone for the PhD educational process. Pass/Fail. This is a Milestone.

PD9000 Policy Analysis
This course is designed to provide students with a foundational understanding of the state and societal processes, institutions, actors, ideas and relations which coalesce in the development and understanding of public policy. The course covers how and where policy is made, as well as, how and where policy is analyzed. It introduces the disciplinary and interdisciplinary foundations of policy analysis. Credit 1

PD9001 Policy Theories and Approaches
This course provides students with a critical examination of the intellectual and theoretical foundations of public policy studies. It reviews the analytical approaches and techniques used to understand, develop and analyze public policies. A broad spectrum of frameworks, models and theories are examined throughout the course. This course also examines the nature of interdisciplinary policy analysis. 1 Credit

PD9002 Research Foundations for Policy Studies
This course will provide students with an understanding of the historical perspectives and contemporary debates related to knowledge and evidence in social science and policy research. Various perspectives on knowledge paradigms, roles of disciplinary knowledge and the scientific method will be examined. Strengths and weaknesses of various research paradigms and approaches will be examined to help students articulate their research assumptions and define their research agendas. The roles of context, foci, purpose, ethics and audiences will be considered in what counts as 'evidence' in policy research and analysis. Central questions examined in the course will include: What is knowledge in policy research? What is the scientific method and how central is it to 'good' policy research? Is policy research science or art? Policy sciences vs. policy studies? What is 'evidence-based' policy research? 1 Credit

PD9004 Fdns of Quantitative Research
This course focuses on the various forms of quantitative research that may be used in the development and analysis of public policy, such as surveys, observational studies, experiments, and the statistical analysis of secondary data. Foundational issues such as research design, the relationship between theory and research, ethical practices, sampling, and measurement will also be addressed. Students will learn the basic techniques needed to implement different quantitative research methods, but the focus will be on developing research literacy and the skills needed to evaluate published research results. 1 Credit

PD9101 Public Policy and Administration
This course focuses on the interface of public policy and public administration. The primary focus is on the theories related to the administrative state and its role in the policy process. The course examines theoretical origins and evolution of public administration as a distinct and interdisciplinary field of intellectual inquiry and research in the broader context of the evolution of the administrative state and its relations with the private and non-profit sectors. An emphasis is placed on theoretical debates and research approaches to understanding the role of the administrative state in policy making, design and implementation for application in any policy area or jurisdiction. The focus will be less on the changing practices, issues and functional areas in public administration and more on the changing concepts and theories that attempt to explain the role and significance of the bureaucracy in public policy.
1 Credit

PD9102 Immigration, Settlement and Diaspora Policies
This course provides advanced examination of policy challenges arising from global migration. This course introduces students to various theoretical and disciplinary approaches to migration. A particular objective is situating Canada's policy responses in a comparative context with other traditional countries of migration, as well as more recent countries of immigrant settlement. Attention will be devoted to analyzing the role of the state, markets and civil society in shaping migration-related policies. The role of research in policy development and analysis is a recurring course theme. Topics of interest include the policy ramifications of immigration, settlement and diaspora related to such issues as: optimal population size, economic imperatives, multiculturalism, newcomer integration, dual citizenship, transnationalism and refugee admission. 1 Credit

PD9103 Social Policy
This course takes a historical, comparative and critical approach to the study of social policy. The focus is on key theories and perspectives in social policy and the fluid boundaries between social policy, economic policy, health policy, environmental policy and justice policy underpinning interdisciplinary approaches to social policy research. Through an emphasis on the political economy of social welfare policy development at the local, national and international levels, the course provides students with an understanding of the evolution of social conditions and examines the influence of different policy ideas, institutions and interests on social policy development and change. This course also examines social capital, social cohesion, diversity and social justice movements. The emphasis is on defining and understanding the broad and inter-related field of social policy as a foundation for further research in a broad range of social policy areas. 1 Credit

PD9200 Directed Studies
This course is designed for individual students who may need a course related to their area of concentration that is not satisfied through course offerings. It will normally be a reading course under the direct supervision of an assigned faculty member with expertise in the chosen subject field. The course requirements will be negotiated on an individual basis with the supervising faculty member, in consultation with the Program Director. 1 Credit

SS8000 Stat Analysis in Social Science Research
SS8001 Advanced Qualitative Methods
SS8100 Urban Policy
SS8200 Justice Policy
See SOCIAL SCIENCE

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PROFESSIONAL COMMUNICATION

CURRICULUM

First Offered Fall 2010

Master of Professional Communication

DEGREE REQUIREMENTS		**Credits**
PC8001	Library Research Colloquium	(Non-credit)
PC8002	Prof Comm: Hist, Theory, Prac	1
PC8003	Research Methods	1
PC8004	Internship	1
PC8005	The Virtual Organization	1
PC8006	Visual Communication and Design	1
AND 3 elective credits		3

AND One of the Following Options:

Major Research Paper (MRP) Option	
Creative Project/MRP and Presentation	Milestone
OR	
Course Only Option	
2 Elective credits	2

Electives		**Credits**
CD8310	Critical Approaches to Cultural Comm	1
CD8320	Media Languages	1
CD8330	Audiences and the Public	1
PC8101	Adv Speaking, Presentat'n Tech	1
PC8102	Communication and Legal Issues	1
PC8103	Communication and Technology	1
PC8104	Crisis Communication	1
PC8105	Proposals, Grants, Fundraising	1
PC8106	Special Topics: Prof Comm	1
PC8107	Strategic Media Relations	1
PC8108	Visual Rhetoric: Public Cntxt	1
PC8109	Directed Studies	1

COURSE LISTING

Major Research Paper

The Major Research Paper is a sustained exploration of a specialized topic supported by material from scholarly sources and a theoretical framework. It may take the form of a critical review of literature or an empirical exploration, and may include research conducted during the MPC internship. The MRP is evaluated by a supervisor and second reader and requires a presentation and a knowledge translation product (e.g. a research poster or a digital representation of the project). Pass/Fail

PC8001 Library Research Colloquium

The Library Research Colloquium will introduce students to the complexities of contemporary library research at the graduate level including the quality of information sources, searching strategies, Boolean nesting and hierarchies, the metrology of information transfer, the journal impact factor, citation styles and bibliographic citation managers. Non-credit course. Pass/Fail

PC8002 Professional Communication: History, Theory, Practice

This course examines how diverse practices of professional communication have evolved and merged into a defined discipline supported by a body of interdisciplinary research. Moving from past to present, we will investigate how the recent shift from traditional to digital and from local to global communication practices and processes has transformed the foundations of professional practice including strategic planning, ethics, and interpersonal, organizational and public communication. Looking towards the future within a media ecology framework, we will theorize the ways current and imagined techno-global communication practices may impact

sustainability on social, economic, political, ethical, and environmental levels. Throughout the course, we will consider how the shift from mechanistic to systems thinking provides new research methods and theoretical models to study these complex and dynamic processes. 1 Credit

PC8003 Research Methods
Students will be introduced to the theories, methodologies and methods that take into account creative, humanities-based and social scientific perspectives. A second goal of the course will be to familiarize students with the research and information gathering process, with the use of library and library resources, electronic and online research, and creative and unusual research strategies.
The third goal is to provide an introduction to the art of project design and the writing of proposals. 1 Credit

PC8004 Internship
The internship allows students to participate in organizational placements that relate to their professional interests and takes place in the second (winter) semester of the MPC program. Students are responsible for identifying potential host institutions and securing their own placements subject to approval by the School of Professional Communication. The internship is approximately 150 hours in duration spread over 8 to10 weeks. The institutional mentor and the intern establish a mutually agreed upon schedule. Students provide the School with regular journal submissions. The institutional supervisor completes an interim and a final report. 1 Credit. Pass/Fail

PC8005 The Virtual Organization
This course addresses the Internet's increasing impact as a dynamic platform of professional communication practices. Students will examine how a knowledge environment fused with social networking capabilities creates unprecedented opportunities, challenges and risks for the contemporary organization and its members. Drawing on case-grounded theory and hands-on investigation, students will explore the organizational revolution implicit in present and emergent technological innovations and virtual networking trends in order to develop the strategic knowledge and critical practices necessary to communicate in the workplace of today while anticipating the workplace of tomorrow. 1 Credit

PC8006 Visual Communication and Design
This course focuses on the processes, products, and purposes of visual communication and design. Students will learn about the ways design is used to reach a range of audiences and communication objectives. Students will apply visual communication concepts, strategies, and techniques to critique and develop visual design solutions to today's communication problems. Assignments will require that students examine the ways theory and practice intersect and the ways design principles can be used in the planning, production, and evaluation of the visual communication. 1 Credit

PC8101 Advanced Speaking and Presentation Technology
This course builds upon fundamental informative and persuasive speaking techniques by introducing students to their advocacy role as professional communicators. Students learn how to adapt high-level messages for a variety of internal and external audiences and effective audience-response strategies. They will learn the use of presentation technology such as PowerPoint, podcasting, and webcasting to transmit their messages effectively. Theories of self-presentation, presentation protocol, medium and message, and cognitive perception underlie the course. Students will deliver presentations to their peers and have the opportunity to use new media facilities to create and broadcast audio podcasts and videocasts for feedback and evaluation. Spoken voice training to achieve clarity and confidence in oral communications is a part of this course. 1 Credit

PC8102 Communication and Legal Issues
This course introduces students to the legal dimensions of professional communication through a variety of practical and theoretical approaches with a strong emphasis on semiotics, especially semantics and syntactics. Students will study the Canadian legal system as it applies to ethical responsibility and legal risk in the written and oral messages exchanged within and between organizations and will consider the degree to which legal formalism and legal realism operate in the determination of judicial decisions. Using detailed case analyses of documents such as briefs, letters, proposals, contracts, and reports, students will examine legal formats and structures, evidence and argumentation, copyright and intellectual property, and "plain language" writing. Students will learn to identify potential risks, and to prepare and manage communications that are clear, accessible, ethical and legal. 1 Credit

PC8103 Communication and Technology
Communication theorist, Lance Strate, writes that "as environments, media do not determine our actions, but they define the range of possible actions we can take, and facilitate certain actions while discouraging others." Using media ecology, convergence culture and media studies as a broad theoretical framework, students will explore the relationships between past and emergent technologies, as well as the relationships that ensue amongst our current technologies. In particular, we will apply different schools of thought to different contexts of professional communication by examining the ways that this web of medial relationships both enables and hinders our professional communication practices. 1 Credit

PC8104 Crisis Communication
Crises can weaken an organization's reputation, diminish employee commitment, and, as numerous historical examples have shown, destroy companies. Communication professionals must know how to predict, prevent, and manage crises. This course explores the theory and practice of crisis communication in a variety of sectors. Using case studies, students examine and analyze the natures of crises; the roles of employees, the media (traditional and electronic), and the public; theories of crisis management and crisis communication; and the role of the communication professional. The stakeholder dialectic and deliberative rhetoric theories are two frameworks that govern the course's investigation into crisis communication modes. 1 Credit

PC8105 Proposal Writing, Grant Seeking and Fundraising
This course provides a detailed introduction to the multidimensional processes of grant-seeking and the strategic principles of writing

proposals for research funding and non-profit fundraising. Through a theoretical framework grounded in classical and modern rhetoric, meta-rhetoric, and narratology, students will explore how professional communicators construct polished arguments to generate support. From the perspective of both grant seekers and multidisciplinary peer-review audiences, students will learn how to identify and target government, foundation, and corporate funding sources/opportunities, to translate project goals and problem statements into clear objectives and hypotheses reflective of societal need, and to coordinate activities in the planning, development, structuring, and articulation of feasible, methodologically rigorous, and conceptually innovative research projects/proposals. Students will also gain practice in applying these techniques to fundraising initiatives and tasks including outreach and the cultivation of potential foundation and corporate donors. 1 Credit

PC8106 Special Topics in Professional Communication
Courses offered on an occasional one-time-only or very limited basis designed to address specific subjects of compelling current interest. Special topics courses will integrate visiting guest lecturers who are experts in the field. 1 Credit

PC8107 Strategic Media Relations
This course examines the theory and practice of effective media relations. Students will explore the geography of the modern media landscape – including both traditional and new media outlets – and learn how to navigate it on behalf of an organization or client. They will study the concepts underlying media relations, and how to employ them in strategic planning, image management, advocacy, and both proactive and reactive interaction with the press. Through a critical analysis of what actually makes a story newsworthy and of how news organizations function, students will learn how to craft and deliver the kind of sharply defined messages that are effective in today's 24/7 news cycle. 1 Credit

PC8108 Visual Rhetoric in Professional Contexts
John Berger tells us that "seeing comes before words." Donis Dondis writes that "there is little rest in the process of seeing". In all of our dealings with the world, we constantly *use* images to persuade others, but we also become *used by* the same images. Drawing on the field of visual social semiotics, this seminar course explores visual meaning-making. It investigates how visual texts can be rhetorical and persuasive within a professional communication context. How do images dominate or become dominated by the viewer/consumer? How do images and written text combine to persuade viewers? What is visual culture? We will draw on the theories of Rudolf Arnheim, Donis Dondis, Gunther Kress and Theo van Leeuwen, amongst others. Objects of analysis will be drawn from print advertisements, organizational documents, digital media, and other multimodal texts in professional contexts.
1 Credit

PC8109 Directed Studies
This course is for students who wish to gain knowledge in a specific area for which no graduate level classes are available in the Winter 2016 semester. Students who are approved to take the course are assigned a suitable class advisor most familiar with the proposed content. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. 1 Credit

Communication and Design Electives
see COMMUNICATION AND DESIGN SECTION

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PROJECT MANAGEMENT IN THE BUILT ENVIRONMENT

CURRICULUM
First Offered Fall 2022

Master of Applied Science (MASc)

DEGREE REQUIREMENTS		Credits
Thesis		(Milestone)
PM8001	Integrated Project Planning	1
PM8002	Project Execution, Monitoring, Control	1
	PLUS	
	Research Methods course from among the following BL8210, SM8103,SM8104, CE8140 (Supervisor approval required)	1
Two Electives		2

Master of Project Management (MPM)

DEGREE REQUIREMENTS		Credits
PM8001	**Integrated Project Planning**	**1**
PM8002	Project Execution, Monitoring, Control	1
PM8003	Cost and Schedule	1
PM8004	Complex Project	1
Six Electives*		6

***Students may complete 4 electives and an MRP with the permission of the graduate program director.**

Program Electives

PM8201	Emergent Design and Construction Processes	1
PM8202	Strategic Leadership and Management	1
PM8203	Int'l Construction Project Management	1
PM8204	Negotiating Legal and Regulatory Issues	1
PM8205	Directed Studies	1
PM8206	Special Topics	1

Other Pre-Approved Electives

All AR (Architecture) and BL (Building Science) 8000 level courses except Seminar and Studio courses
CV8102 Advanced Construction Management
CV8105 Construction Administration and Management
CV8110 Infrastructure Asset Management
CV8210 Environmental Impact Analysis
CV8303 Renov/Repair - Existing Struct
CV8306 Durability of Structures
CV8311 Risk and Reliability for Eng
CV8501 Advanced Geospatial Info Systems
CV8503 Geospatial Modeling & Visualization
CV8504 Estimation and Data Series Analysis
CV8505 GIS for Civil Engineering
ME8124 Multiple Participant/Objective Dec. Making
ME8127 Optimization Models
ME8128 Prob Models in Operation Rsrch
ME8201 Design of Algorithms and Programming for Massive Data
ME8202 Machine Learning
ME8203 Management of Big Data and Big Data Tools
ME8204 Data Mining and Prescriptive Analytics
MB8014 Innovation and Technology Management
MB8110 Integrating AI: Business Process Management Perspective
MB8111 Negotiation and Conflict
MB8112 Predictive Analytics for MBAs

MB8113 Dynamic Decision Making and Problem Solving
MB8114 Organizational Decision Making
MB8115 Fundamentals of Data Science for Management
MB8117 Project Management
MB8120 Data Science for MBAs
MB8121 Disruptive Digital Transformation
MB8124 Social Media Analytics
MB8137 Pop Up Topics in Mgmt

Course Listing

Thesis
This is a Milestone

PM8001 Integrated Project Planning
This is the first of two Case-Based and Project-Based Learning courses that address the continuous process of managing a project from conception to operations, framed in the context of a rapidly-changing built environment shaped by evolving environmental, social, and economic realities. This course focuses on the three pedestals of project management: cost, time, and scope, which are addressed through comprehensive integrated project plan, developed consistent with industry best practices and ritically considering emerging approaches. 1 Credit

PM8002 Project Execution, Monitoring, Control
This course continues the Project- and Case-Based Learning used in PM8001, focusing on the critical activities and decisions made by Project Managers during the Execution, Monitoring & Control, and Closing phases of a project. Post-occupancy operations, facility management and deconstruction/re-use will be considered with a special focus on minimizing the environmental impact of construction and maximizing social and economic benefits. As with PM 8001, emerging technologies will be critically considered. 1 Credit.

PM8003 Cost and Schedule
This course will provide an advanced understanding of building economics, including business case analysis and feasibility, development pro-forma, techniques for cost evaluation, cost control and value engineering strategies, life-cycle cost evaluation, IRR and ROI calculation, financing tools and total cost of borrowing. Both hard and soft costs will be considered throughout the project lifecycle (design, construction, operations, de-commissioning). Construction scheduling techniques are also covered to address the full spectrum of project deliverables. 1 Credit.

PM8004 Complex Project
This course serves as a culmination of the research, discourse, and application of project management knowledge. This four-month project draws upon the diverse backgrounds of four PMBE students in undertaking a comprehensive strategic assessment of an organization within the AECO industry within the framework of all its operational areas and proposes feasible and actionable strategic solutions. The summative project culminates in a presentation identifying strategic direction with implementable and actionable recommendations. 1 Credit.

PM8201 Emergent Design and Construction Processes
This course will focus on the application of virtual technologies to the design and construction processes, including digital tools for coordination, phasing and scheduling, and cost estimation, digital design and fabrication, visualization tools, IoT devices for construction site and facility data collection, adaptive building technologies, and the use of digital twins. Given rapid technology advancement, this course will incorporate case-based research into emerging technologies and their current or potential impacts on the project delivery process. 1 Credit.

PM8202 Strategic Leadership and Management
This course provides the foundations of functional, business, and corporate strategy for management critical in the operations and growth of organizations in the AECO industry. This course promotes the development of leaders in the dynamic AECO industry through in-depth analyses of strategic decision-making models applied and reinforced with case-based exercises. This course focuses upon developing knowledge essential in leadership over a range of project stakeholders and skill development in recruiting, presentation, negotiation, and networking. 1 Credit.

PM8203 Int'l Construction Project Management
This Course will inspire students to recognise the growing relevance of globalisation and how they relate to construction at large and to the Canadian construction industry. It will broaden their decision-making horizons beyond Canada. They will be made aware of issues and risks they may have to deal with in a highly competitive international market. 1 Credit.

PM8204 Negotiating Legal and Regulatory Issues
This course will introduce the legal aspects on construction including standard forms of contract; tort and liability; bonds and insurance; lien acts; dispute resolution; procurement law; professional liability; zoning and land use regulations; acquisitions and transactions; leases; and intellectual property. Students will also learn how to identify contractual traps and negotiate favorable terms. Navigating the Governance structures and the regulatory environment will also be discussed, focused on the project approvals process and potential site limitations. 1 Credit.

PM8205 Directed Studies
With the approval of the program director and supervisor, students enrolled in the graduate program in Project Management in the Built Environment may take a Directed Study course to gain knowledge in an area relevant to their research for which no graduate-

level course is offered. A faculty member must supervise the study, and appropriate assignments (exam, report, etc.) will be agreed upon before registration. 1 Credit

PM8206 Special Topics
This course consists of lectures, seminars, and readings covering the latest advances and research in a field related to Project Management in the Built Environment. The course description will be announced prior to scheduling of the course. 1 Credit

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PSYCHOLOGY

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		Credits
Psychological Science Field		
Thesis		(Milestone)
PS8101	Stats and Research Design I	1
PS8102	Stats and Research Design II	1
PS8201	Appl, Translational Rsrch Meth	1
PS8202	Practicum in Psych Science I	1
PS8203	Psychological Science Seminar I	1
Two Psychology electives		2
Clinical Psychology Field		
Thesis		(Milestone)
PS8101	Stats and Research Design I	1
PS8102	Stats and Research Design II	1
PS8103	Clinical Research Methods	1
PS8301	Psychopathology	1
PS8304	Treatment of Psych Disorders	1
PS8306	Practicum in Clinical Psych I	1
PS8309	Psychological Assessment I	1
PS8310	Psychological Assessment II	1
PS8312	Culturally Informed Clinical Practice	1
PS9306	Cognitive and Behavioural Therapies	1
Two Psychology electives*		2

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Psychological Science Field		
Comprehensive Requirement		(Milestone)
Dissertation		(Milestone)
PS9201	Psych Sci Professional Issues	1
PS9202	Practicum in Psych Science II	1
PS9204	Psychological Science Seminar II	1
Two Psychology electives		2
(If a History of Psychology credit was not completed at the MA or senior undergraduate level, PS9101 History of Psychology must be one of the electives.)		
Clinical Psychology Field		
Comprehensive Requirement		(Milestone)
Dissertation		(Milestone)
Internship in Clinical Psych		(Milestone)
PS8303	Systems of Psychotherapy	1
PS9301	Ethical/Prof Issues Clin Psych	1
PS9303	Practicum in Clinical Psych II	1
PS9304	Practicum in Clinical Psych III	1
Four Psychology electives*		4
(If a History of Psychology credit was not completed at the MA or senior undergraduate level, PS9101 History of Psychology must be one of the electives.)		

Foundational Areas:

Biological Bases of Behaviour

Cognitive-Affective Bases of Behaviour

Social Bases of Behaviour

Individual Behaviour

Historical and Scientific Foundations of General Psychology

*To meet the breadth requirements for accreditation with the Canadian Psychological Association, clinical psychology students are required to take graduate or undergraduate courses covering the five foundation areas.

Electives		**Credits**
Psychological Science		
PS8501	Special Topics in Cognition	1
PS8502	Special Topics in Developmental Psych	1
PS8503	Special Topics in Health Psychology	1
PS8504	Special Topics in Social Psychology	1
PS8506	Percept and Cognitive Ergonomics	1
PS8507	Cognitive Neuroscience	1
PS8508	Critical Perspectives in Psych	1
PS8509	Culture and Identity	1
PS8510	Early Development	1
PS8511	Gender and Health	1
PS8512	Learning, Plasticity, Memory	1
PS8513	Multivariate Statistical Analysis	1
PS8515	Psychology of Aging	1
PS8516	Psychology and Law	1
PS8517	Psychometric Theory, Scale Development	1
PS8518	Research Design in Child Devel	1
PS8519	Social Cognition	1
PS8520	Social-Cognitive Development	1
PS8521	Community Psychology	1
PS8522	Directed Readings: Psych Sci	1
PS8523	Prejudice and Discrimination	1
PS8524	Perception and Action	1
PS8525	Practicum in Teaching	1
PS8526	Special Topics in Perception	1
PS8527	Computational Methods in Psych	1
PS8528	System and Meta-Analyt Reviews	1
PS8529	Qualitative Research Methods	1
PS8530	Psychology of Body Image	1
PS8531	Anatomy of the Human Brain	1
PS8532	Cognitive Aging	1
PS8533	Program Evaluation	1
PS8534	Special Topics in Biopsych	1
PS8535	Sleep	1
PS8536	Special Topics in Sexuality	1
PS8537	Special Topics in Psychological Methods	1
PS8538	Industrial/Organizational Psychology	1
PS9101	History of Psychology	1
PS9203	Practicum in Psychological Science III	1

ELECTIVES

Clinical Psychology

PS8538	Industrial/Organizational Psychology	1
PS8701	Special Topics in Clinical Psych	1
PS8703	Anxiety Disorders	1
PS8704	Developmental Psychopathology	1
PS8705	Clinical Neuropsychology	1
PS8706	Clinical Psychopharmacology	1
PS8707	Cognition and Psychopathology	1
PS8708	Eating Disorders	1
PS8709	Directed Readings: Clin Psych	1
PS8710	Couple and Family Therapy	1
PS8711	Child and Adolescent Intervention	1
PS8712	Mood Disorders	1
PS8713	Psychology of Addictive Disorders	1
PS8714	Multilevel Modelling	1
PS8715	Structural Equation Modelling	1
PS9305	Practicum in Clinical Psych IV	1
PS9307	Supervision, Consultation, & Evaluation	1

COURSES

Internship in Clinical Psychology
Supervised internship in a community setting approved by the Director of Clinical Training. This internship is required of all PhD Clinical Psychology students and must be taken over the course of a full year. Prerequisites: Completion of all course requirements in the PhD Clinical Psychology program, and approval of the Director of Clinical Training. This is a "Milestone" required for all Clinical Psychology PhD students. Pass/Fail

Master's Thesis
Independent research leading to an acceptable master's thesis. This is a "Milestone." Pass/Fail

Comprehensive Requirement
Doctoral students will be required to develop an original research question that they will address via a written paper.
The comprehensive requirement is designed to provide breadth and depth of knowledge, and to develop skills as an independent researcher. The comprehensive requirement is typically completed in the first year of the PhD. This is a "Milestone." Pass/Fail

Doctoral Thesis
Independent research leading to an acceptable doctoral dissertation. This is a "Milestone." Pass/Fail

PS8101 Statistics and Research Design I
This course covers the foundations of research design and statistical hypothesis testing. Topics covered include experimental and nonexperimental research design, probability theory, power analysis, statistical inference, and an introduction to advanced statistical software. This course is required of all graduate students in psychology during the first semester of their first-year, and it is the first part of a required two-course sequence on this topic. Prerequisites: Undergraduate course(s) in psychology statistics or equivalent. 1 Credit.

PS8102 Statistics and Research Design II
This course covers basic and advanced applications of the general linear model for psychological data. Topics covered include correlation, multiple regression with categorical and continuous predictors, moderation, mediation, and logistic regression. This course is required of all graduate students in psychology during the second semester of their first year, and is the second part of a required two-course sequence on this topic. Prerequisites: Statistics and Research Design I. 1 Credit

PS8103 Clinical Research Methods
This course offers a review of research methods in clinical psychology, including issues related to design, measurement, and interpretation. Topics to be covered include test construction and psychometrics, experimental and observational methods in clinical research, single case experimental designs, qualitative research, research ethics, and diversity issues in clinical research. This course is required of all MA Clinical Psychology students.1 Credit

PS8201 Applied and Translational Research Methods
An introduction to applied and translational research methods. In the first half of the course, discussions will include how to balance good science with specific real-world objectives and how to translate laboratory findings into real-world solutions. In the second half of the course, students engage in directed readings that will prepare them for their Practicum placements (e.g., Cognitive Ergonomics, Program Evaluation). 1 Credit

PS8202 Practicum in Psychological Science I
This practicum is designed to provide students with breadth in psychological research methods and approaches. Students contribute to a single project that is complementary to their core area of interest or in multiple smaller projects, spanning multiple labs. This course is required for all MA students in Psychological Science. Pass/Fail. 1 Credit

PS8203 Psychological Science Seminar I
This course provides professional development training and exposure to the broad scope of research in one area of Psychological Science. The content will alternate between major themes within Psychological Science (e.g., Social Psychology; Applied Cognitive Neuroscience), with specific topics focusing on contemporary issues and recent research. This course is required for all MA students in Psychological Science. 1 Credit

PS8301 Psychopathology
An overview of issues related to diagnostic features, epidemiology, developmental factors, etiology, and descriptive psychopathology for a wide range of psychological disorders, including anxiety disorders, obsessive-compulsive and related disorders, posttraumatic stress disorder, depressive disorders, bipolar and related disorders, personality disorders, substance-related and addictive disorders, and others. This course is required of all MA Clinical Psychology students. 1 Credit

PS8303 Systems of Psychotherapy
An overview of theory and research related to psychotherapy and behaviour change. Includes a review of the major schools of psychotherapy, including cognitive and behavioural therapies, interpersonal psychotherapy, psychodynamic psychotherapy, experiential and humanistic psychotherapies, medication-assisted psychotherapy, couples and family therapies, and group therapy. In addition, nonspecific aspects of psychotherapy will be discussed, including the therapeutic relationship, client factors, and therapist factors that contribute to outcome. This course is required of all PhD Clinical Psychology students. 1 Credit

PS8304 Treatment of Psychological Disorders
An overview of theory and practice of evidence-based, psychological and biological treatments for a wide range of psychological disorders, including anxiety disorders, mood disorders, somatoform disorders, psychotic disorders, eating disorders, personality disorders, sexual and gender identity disorders, substance use disorders, cognitive disorders, and others. This course is required of all second-year graduate students in clinical psychology. 1 Credit

PS8306 Practicum in Clinical Psychology I
Practicum training in psychological assessment and intervention under the close supervision of one or more registered clinical psychologists at the Psychology Training Clinic or other community setting. The minimum duration is 300 hours. This course is required of all MA Clinical Psychology students. Prerequisites: PS8301 Psychopathology; PS8309 Psychological Assessment I; PS8310 Psychological Assessment II; PS8312 Culturally-Informed Clinical Practice. Pass/Fail. 1 Credit

PS8309 Psychological Assessment I
This course explores the theory and practice of cognitive and personality assessment for both adults and children, with an emphasis on evidence-based measures. Instruction in cognitive assessment includes exposure to intellectual assessment methods and neuropsychological measures, and evaluation of standardized administration of intelligence tests. Personality assessment training will include exposure to objective and projective methods. Issues related to ethics in assessment are also covered. This course is required of all MA Clinical Psychology students. 1 Credit

PS8310 Psychological Assessment II
This course expands upon issues covered in Psychological Assessment I, and includes discussion of topics such as clinical interviewing, evidence-based diagnostic assessment, risk assessment, behavioural assessment, and cultural considerations in assessment. Prerequisites: PS8301 Psychopathology; PS 8309 Psychological Assessment I. This course is required of all MA Clinical Psychology students. 1 Credit

PS8312 Culturally Informed Clinical Practice
This course focuses on the development of foundational skills in psychotherapy within a culturally informed framework. Students will learn about different forms of diversity, intersecting identities, and oppression, and explore how privilege, beliefs, attitudes, behaviours, worldviews, and biases can impact therapeutic relationships and dynamics. Essential skills will be taught using readings and experiential exercises. This course is required of all MA Clinical Psychology students. 1 Credit.

PS8501 Special Topics in Cognition
This course will be offered from time to time, with the specific topic varying from year to year depending on the instructor and student interests (e.g., eye-witness memory, cognitive aging, thinking and reasoning, etc.). 1 Credit

PS8502 Special Topics in Developmental Psych.
This course will be offered from time to time, and explore different developmental stages (e.g., infancy, childhood, adolescence), tasks, and theories with the specific topic varying from year to year depending on the instructor and student interests (e.g., risk and resilience; developmental cognitive neuroscience; mind, brain, and education; digital childhood; context and social relationships). 1 Credit

PS8503 Special Topics in Health Psychology
This course will be offered from time to time, with the specific topic varying from year to year depending on the instructor and student interests (e.g., treatments of medical disorders, psychology and cancer; nutrition and body image; psychology and HIV; psychology of pain; gender and health; systemic impacts on health; the health care system; health policy formation, etc.). 1 Credit

PS8504 Special Topics in Social Psychology
This course will be offered from time to time, with the specific topic varying from year to year depending on the instructor and student interests (e.g., social comparison; psychology of persuasion, etc.). 1 Credit

PS8506 Perceptual and Cognitive Ergonomics
An overview of research in the emerging field of cognitive ergonomics. Includes a survey of successful cognitive ergonomic interventions and research methods for assessing the fit between human perceptual-cognitive abilities and the demands of a machine, task, or environment. 1 Credit

PS8507 Cognitive Neuroscience
This course provides an overview of the neural mechanisms underlying cognition. It will include 1) a brief review of neuroanatomy, 2) an introduction to current brain-based techniques (e.g., MRI, EEG, lesion studies), and 3) a critical review of findings and theories on the relations between the brain, cognition, and behaviour in current cognitive neuroscience literature, with emphasis on topics such as perception, executive control, attention, memory, and decision making. 1 Credit.

PS8508 Critical Perspectives in Psychology
Drawing on a variety of conceptual frameworks, this course provides an overview of epistemological, theoretical, and empirical underpinnings of critical psychology. The focus is on a historically grounded analysis of both foundational and recently developed psychological constructs, while critically evaluating the ways in which psychology as a discipline not only discovers but also shapes knowledge about human behaviour, cognition, and emotion. Examples of deconstructing, decolonizing and reconceptualizing psychological concepts, theories, and methods will be emphasized. 1 Credit

PS8509 Culture and Identity
This course serves as an introduction to the interrelated concepts of culture and identity. Topics discussed may include race, ethnicity, immigration, indigenous heritage, power, gender, sexual orientation, and disability, and their influence on several domains, including psychological processes and health. The course is also intended to facilitate students' professional work with diverse populations. 1 Credit

PS8510 Early Development
This course examines primary research from the period of prenatal development to early childhood and adolescence. The core content and themes, drawn from both basic developmental science and clinical psychology, will vary with each offering of the course to reflect contemporary issues in the field encompassing such topics as: basic processes such as perceptual-motor intelligence; caregiver-infant relationships; language acquisition and literacy; social-cognition and the social-cultural context of early development. The course will focus strongly on the diverse research methods associated with working with infants, children, and parents. 1 Credit

PS8511 Gender and Health
An overview of the relationship between biological, psychological, and socio-cultural determinants of health and illness, including health behaviours, the health care system, and health policy formation. Gender will be examined as both a biological (e.g., hormonal) and socio-cultural variable in relation to a range of specific topics, including: stress, psychoimmunology, cardiovascular disease, cancer, pain, and disability. 1 Credit

PS8512 Human Memory
A survey of various aspects regarding the acquisition, retention, and retrieval of memories. Critical discussions will cover principles and mechanisms of learning, cognitive and neural organization of memory, memory processes, and forms of cognitive and neural plasticity. These domains will be extended to applied areas including mnemonic techniques (e.g., strategies, rehabilitation), disorders of memory (e.g., amnesia), lifespan issues (e.g., development, aging), and the malleability and reconstructive processes of learning and memory (e.g., false memories). 1 Credit

PS8513 Multivariate Statistical Analysis
An introduction to multivariate statistical methods in psychology. Techniques covered include multivariate analysis of variance, multiple regression, factor analysis, cluster analysis, discriminant function analysis, hierarchical modeling, structural equation modeling, and canonical correlation. Prerequisites: Statistics and Research Design I and II. 1 Credit

PS8515 Psychology of Aging
This course will provide students with a theoretical and empirical research framework for understanding the psychology of aging. The topics will include a broad range of age-related changes in sensory, perceptual, cognitive, personality, and social cognitive processes, as well as social and cultural aspects of aging. Factors such as brain changes, health, and lifestyle issues will be discussed in terms of how they may influence the observed age-related differences in behaviours and attitudes. 1 Credit

PS8516 Psychology and Law
In-depth discussion of the theoretical and practical issues related to the intersection between psychology and the law. Students will explore challenges inherent in combining psychology's empirical approach with the legal system's focus on case-rulings. Topics may include the role of the jury, expert and ethical issues, risk assessment, fitness to stand trial, criminal investigation techniques, wrongful convictions, false confessions, cognitive errors, structural inequalities, and the role of memory in the legal realm. 1 Credit

PS8517 Psychometric Theory and Research
This course focuses on measurement theory, scale construction, item response theory, and the interpretation of related issues. Topics covered include psychometric scaling methods, exploratory and confirmatory factor analysis, reliability analysis, test interpretation, measurement of change, and issues pertaining to the analysis of quantitative experimental and nonexperimental data. 1 Credit

PS8517 Psychometric Theory and Scale Development
This course focuses on psychological measurement, classical test theory and scale construction. Topics include validity theory, reliability analysis, test interpretation, exploratory and confirmatory factor analysis, and item response theory. 1 Credit

PS8518 Research Design in Child Development
Focuses on the unique conceptual, design, and analytic challenges that face researchers working with young children. Specific topics may include the design and meaning of habituation and "looking time" studies with infants, the use of observational techniques with young children, and the pragmatic issues surrounding interviewing and questioning children. For each topic, discussion will begin with research that demonstrates why children must be treated differently from adults in research studies (e.g. how children's understanding of the pragmatics of language differs from adults') and then go on to address how researchers might compensate for those differences. Methodologies designed specifically to gather developmental data, such as longitudinal designs, will also be given emphasis. 1 Credit

PS8519 Social Cognition
This course reviews theory and research relating to ways in which people perceive, process, store, and apply information about other people to make sense of their social world. Topics will include attitudes, emotion, judgment under uncertainty, social attribution, stereotypes and prejudices, interpersonal attraction, social comparison, categories and schemas, the relationship between motivation and cognition, and methods for studying social cognition. 1 Credit

PS8520 Social-Cognitive Development
This seminar explores and evaluates theories and empirical findings on the social-cognitive development of children, particularly those concerning the role of cognitive development and social context in children's developing understanding of the social world. It also aims to promote a more contextualized understanding of aspects of social-cognitive development that have important social and policy implications. 1 Credit

PS8521 Community Psychology
This course provides a critical survey of community psychology and the relationship between the social environment and psychological wellbeing. General themes include ecological analysis, stress, community mental health, program development/evaluation, and community supports for individuals with a range of social problems, including homelessness, substance abuse, involvement in the criminal justice system, social marginalization, and health disparities between social groups. Emphasis will be on social problems and how community-academic partnerships can foster change. 1 credit

PS8522 Directed Readings in Psychological Science
This course involves meetings between a student and a faculty member to discuss readings related to a topic of mutual interest.
1 Credit

PS 8523 Prejudice and Discrimination
This course examines origins of prejudice, the impact of discrimination and stigma, and intergroup relations from a social psychological perspective. The role of political and sociocultural factors in shaping psychological processes are considered. Topics may include: psychological, motivational, and cultural sources of prejudice; contemporary manifestations of bias and discrimination; experiences of targets; and approaches to prejudice/bias reduction and group equality and inclusion. 1 Credit.

PS8524 Perception and Action
This course will cover core issues in visual, auditory, and multimodal perception. Research that considers perceptually guided action will also be considered. 1 Credit

PS8525 Practicum in Teaching
Students in this course will receive closely supervised, pedagogical training in planning, preparing, and delivering an undergraduate course in psychology using best practices in teaching. Training will also include strategies for evaluating student progress. Students will have the opportunity to have their teaching observed and videotaped and to receive feedback from the instructor and the other students in the practicum. Pass/Fail. 1 Credit

PS8526 Special Topics in Perception
This course will be offered from time to time, with the specific topic varying from year to year depending on the instructor and student interests (e.g., music perception and cognition, clinical perception and perceptual disabilities, perceptual and cognitive aging). 1 Credit

PS8527 Computational Methods in Psychology
This course introduces students to computational methods in use within perceptual, cognitive and brain sciences. Topics include signal processing, stimulus control, psychophysiology (GSR, EMG, HR, RR, EEG/ERP), data filtering, and data reduction. Each topic will be introduced using examples from the literature and will be explored using a combination of theory and application. The course is designed to be of use for students with or without prior programming experience. 1 Credit

PS 8528 Systematic Meta-Analytic Reviews
Empirical evidence in psychology and related disciplines is burgeoning at a rate that threatens our ability to assimilate it. For this reason, there is a growing emphasis on literature syntheses that integrate available information comprehensively, critically, and without bias. In this course, students will learn two such methods, systematic review and meta-analysis. Students will learn to identify, appraise, and synthesize research evidence both qualitatively and quantitatively. Prerequisite: PS8101 and PS8102.
1 Credit

PS8529 Qualitative Research Methods
Qualitative research emphasizes the complexity and diversity inherent to psychology, and permits rigorous investigations that preserve the contexts within which cognitions, emotions, and behaviours occur. The goal of this course is to examine epistemologies, ontologies, theoretical approaches, and techniques of qualitative inquiry used in the study of psychological phenomena. The course will blend lecture and experiential learning in areas of data collection methods, approaches to data analysis, interpretation, and presentation of research findings. 1 Credit

PS8530 Psychology of Body Image
This graduate seminar covers current theories, research and controversies in the area of body image. Topics include theoretical conceptualizations of body image, familial influences, and individual differences (including gender, personality, race/ ethnicity and culture). Body image in psychiatric and medical contexts are considered, as are the effects of modifications to the body (diet, exercise, surgery). The course also includes a critical appraisal of treatment and prevention of body image problems. 1 Credit.

PS8531 Anatomy of the Human Brain
This course involves an in-depth review of human brain anatomy in the context of Psychology. In addition to terminology and topography of brain structures, emphasis is placed on the association between brain structure (anatomy), brain function (activity) and behaviour. Applied topics may vary by instructor (e.g., MRI methods; relations to biological sex, social determinants of health, and aging; diseases of aging; neurodevelopment; neuroevolution). 1 Credit

PS8532 Cognitive Aging
This course provides a comprehensive overview of cognitive aging research, with a major focus on cross-sectional and longitudinal studies of healthy aging and a minor focus on pathological aging. Specific topics could include: research methods in cognitive aging; the aging brain; mild cognitive impairment and dementia; genetics; aging in major cognitive domains (perception, attention and executive function, memory, decision making); affective influences on cognition; as well as cognitive plasticity and brain reserve. 1 Credit

PS8533 Program Evaluation
The course will provide knowledge and practice in the current methods for evaluating programs and services. Topics include: logic models; ethical issues; measurement of processes and outcomes; instrument development and selection; budgeting; data collection; analysis; and reporting and dissemination. Students will gain hands-on skills in needs assessment, process evaluation and outcome evaluation through service learning projects conducted in collaboration with local community organizations. 1 Credit

PS8534 Special Topics in Biopsychology
This course will be offered from time to time with the specific topics varying from year to year depending on the instructor and student interests (e.g., biology of stress and stress outcomes, sexual and reproductive behaviour, neurobiology of mood disorders). 1 Credit

PS8535 Sleep
The purpose of this course is to provide students with the behavioural perspectives on sleep. Topics will include: 1) healthy sleep across the life cycle, 2) sleep deprivation under human and animal models, 3) understanding sleep-wake mechanisms via basic research, 4) sleep physiology, 5) chronobiology, and 6) pathological sleep. The course will emphasize theoretical and therapeutic perspectives with empirical support. 1 Credit

PS8536 Special Topics in Sexuality
This course will be offered from time to time with the specific topics varying from year to year depending on the instructor and student interests (e.g., critical perspectives on sexuality research; sexual disorders and functioning.) 1 Credit

PS8537 Special Topics in Psychological Methods
This course focuses on advanced quantitative methods in psychology. Specific topics will vary from year to year, according to faculty and student interests (e.g., Bayesian statistics, nonparametric tests, missing data analysis, generalized linear models, survival analysis, psychophysiological methods). 1 Credit

PS8538 Industrial Organizational Psychology
This course provides the student with knowledge of the core areas of industrial/organizational psychology. Students will gain knowledge of personality/individual differences and how employees change, adjust, and develop across the lifespan and their career. They will also learn about assessments for selection, promotion, and training of personnel. From an organizational perspective, they will gain knowledge on organizational behaviour, the development of interventions, and change management. 1 Credit

PS8701 Special Topics in Clinical Psychology
This course will be offered from time to time, with the specific topic varying from year to year depending on the instructor and student interests (e.g., advanced assessment; emotion focused therapy, interpersonal psychotherapy). 1 Credit

PS8703 Anxiety Disorders
This course introduces students to issues related to psychopathology, assessment, and treatment of anxiety disorders. Examples of covered topics include epidemiology, theoretical perspectives, etiology, biological factors, psychological factors, and evidence-based treatments. 1 Credit

PS8704 Developmental Psychopathology
This course provides an intensive survey of core and current issues within the literature dealing with social, emotional, and behavioural disorders in children and adolescents. Current theory and research and their implications for clinical practice are examined. In addition, theoretical and methodological advances related to research on risk and protective factors and developmental trajectories and their influence on issues such as early school dropout, juvenile delinquency, substance abuse, and adolescent suicide, will be critically examined. 1 Credit

PS8705 Clinical Neuropsychology
This course is an overview of current knowledge relevant to clinical neuropsychology and the fundamental principles of neuropsychological assessment. From a single-case study designapproach, information from a variety of sources, such as observable signs, interviewing, histories and neuropsychological tests will be used to detect and evaluate cerebral dysfunction. Focus will be on the nature of different types of disorders, the symptoms that emerge from brain damage and procedures used to assess these symptoms. Prerequisites: PS8309 Psychological Assessment I; PS8310 Psychological Assessment II. 1 Credit

PS8706 Clinical Psychopharmacology
This course focuses on current practices regarding pharmacotherapy for forms of psychopathology. Following a review of essential principles of psychopharmacology, the clinical application of major classes of drugs to treat psychological disorders will be covered (e.g., anxiolytics, antipsychotics, antidepressants, etc.). The mechanisms of action and scientific evidence, along with historical and philosophical backgrounds, supporting the use of these drugs will be discussed. The course will also touch on aspects of drug interactions, child/adolescent treatment, and appreciation of the broader role neurochemistry plays in daily thought and behaviour. 1 Credit

PS8707 Cognition and Psychopathology
An overview of issues and findings related to cognitive processes associated with psychological disorders. Four broad areas will be discussed: 1) theories and main findings regarding use of neuropsychological and cognitive-science paradigms in studying psychological disorders; 2) issues regarding identification of cognitive deficits in psychopathology; 3) the role of cognition in psychological symptoms and functioning; 4) longitudinal factors (e.g., premorbid risk, profiles across time). 1 Credit

PS8708 Eating Disorders
This course provides an overview of the etiology, prevalence, assessment, diagnosis, and treatment of eating disorders. Topics include: historical trends, diagnostic controversies, theoretical models of risk and maintenance factors, and evidence-based assessments and interventions for eating disorders. 1 Credit

PS8709 Directed Readings: Clinical Psychology
This course involves meetings between a student and a faculty member to discuss readings related to a topic of mutual interest. 1 Credit

PS8710 Couple and Family Therapy
Students in this course will be introduced to various theories and associated interventions designed to improve couple and family functioning, with particular emphasis placed on evidence-based theory and treatment. Specific clinical issues, including sexual problems, intimate aggression and infidelity, as well as treatment of individual psychopathology in a couple/family context will be explored. Individual development, race/ethnicity, sexual diversity, and other individual differences in case conceptualization and treatment provision will be considered throughout. 1 Credit

PS8711 Child and Adolescent Intervention
Students will be introduced to intervention approaches for working with children and adolescents. Clinical assessment, case conceptualization, and a range of psychotherapeutic approaches for common psychological disorders will be discussed. An emphasis will be placed on evidence-based approaches, working with individuals, parents and systems, as well as developmental considerations, diversity, and other individual differences. 1 Credit.

PS8712 Mood Disorders
Students in this course will be introduced to evidence-based theories and interventions for mood disorders. Of particular interest will be demographic issues in mood disorders, such as sex, culture/ethnicity and age, as well as differences associated with diverse treatment settings, such as primary care and specialized mental health settings. The role of mood in women's health (e.g., premenstrual dysphoria, menopause, pregnancy, postnatal depression) will also be discussed. 1 Credit.

PS8713 Psychology of Addictive Disorders
This course provides an overview of the dominant theories and research regarding the construct, etiology, and development of substance and behavioral addictive disorders as well as their mental health comorbidities. The course will examine both the history and sociocultural context (i.e., stigma, health disparities) of addictive disorders from a critical perspective. Evidence-based assessments and treatments will be discussed. 1 Credit

PS8714 Multilevel Modelling
This course provides the theory and application of hierarchical or multilevel models for clustered data. Topics include data structures, nested or clustered data, fixed and random effects, centering strategies, and longitudinal applications. Students will gain experience conducting the analyses using statistical software. Prerequisites: Statistics and Research Design I and II. 1 Credit

PS8715 Structural Equation Modelling
This course provides the theory and application of structural equation models. Topics include path analysis, exploratory and confirmatory factor analysis, the foundations of psychometric theory, and advanced latent variable modelling. Students will gain experience conducting the analyses using statistical software. Prerequisites: Statistics and Research Design I and II. 1 Credit

PS9101 History of Psychology
This course critically explores the roots of modern psychology with an emphasis on the impact of personal, sociocultural, historical, and political factors. Students will engage in a critical analysis of psychological theory, research and practice, and explore the impact of Western assumptions and barriers for and treatment of groups that have been underrepresented and stigmatised in psychology. The course focuses mostly on the history of Western psychology; however, students will explore Indigenous psychologies. 1 Credit

PS9201 Professional Issues and Ethics in Psychological Science
An overview of topics related to professional development, including finding a job or postdoctoral fellowship, acquiring grants, research ethics, professional affiliations, and managing a research program. Advantages and disadvantages of career opportunities in both academia and industry will be explored. This course is required for all doctoral students in Psychological Science. 1 Credit

PS9202 Practicum in Psychological Science II
This second practicum is designed to provide students with additional breadth in research methods. Students lead a research project that is complementary to their core research area. Students are encouraged to consider the societal relevance of the project and connections to their main line of research. Prerequisites: PS8202, PS8101, PS8102, PS8201. Pass/Fail. 1 Credit

PS9203 Practicum in Psychological Science III
This advanced internal or external practicum is designed to provide students with additional breadth in applied methods. Students are encouraged to consider the societal relevance of their chosen project and connections to their main line of research. Prerequisites: Completion of Practicum in Psychological Science II. Pass/Fail. 1 Credit

PS9204 Psychological Science Seminar II
This PhD level course provides additional professional development training and exposure to research in one area of Psychological Science. The content will alternate between major themes within Psychological Science (e.g., Social Psychology; Applied Cognitive Neuroscience), with specific topics focusing n contemporary issues and recent research. This course is required for all PhD students in Psychological Science. 1 Credit

PS9301 Ethical and Prof Issues in Clinical Psych
This course covers ethical and legal issues in clinical psychology research, teaching, assessment, and treatment, with an emphasis on the Canadian Code of Ethics for Psychologists and the College of Psychologists of Ontario Standards and Guidelines of professional conduct. Ethical issues related to cultural, racial, and gender diversity in the practice of psychology are also discussed. This course is required of all PhD Clinical Psychology students. 1 Credit

PS9303 Practicum in Clinical Psychology II
Practicum training in psychological assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. Students are encouraged to apply for practicum placements from an approved list of supervisors and sites. The minimum duration is 350 hours. This course is required of all PhD Clinical Psychology students. Prerequisites: Completion of Practicum in Clinical Psychology I. Pass/Fail. 1 Credit

PS9304 Practicum in Clinical Psychology III
Advanced practicum training in psychological assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. Students are encouraged to apply for practicum placements from an approved list of supervisors and sites. The minimum duration is 350 hours. This course is required of all PhD Clinical Psychology students. Prerequisites: PS9303 Practicum in Clinical Psychology II. Pass/Fail. 1 Credit

PS9305 Practicum in Clinical Psychology IV
Advanced practicum training in psychological assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. The minimum duration for this elective practicum course is 120 hours. Prerequisites: Completion of Practicum in Clinical Psychology III and approval of the Director of Clinical Training. Pass/Fail. 1 Credit

PS9306 Cognitive and Behavioural Therapies
An in-depth course on theory and practice of cognitive and behavioural therapies. Topics covered include behavioural strategies, cognitive strategies, third-wave interventions, strategies for enhancing motivation, and culturally responsive CBT. Clinical strategies will be taught using experiential exercises. This course is required of all MA Clinical Psychology students. 1 Credit

PS9307 Supervision, Consultation, & Evaluation
This course provides an introduction to supervision, consultation, and program evaluation. Models of supervision and best practices in supervision will be discussed as they relate to clinical and research settings. Consultation will be covered in the context of healthcare, research, industry, and related areas. Finally, students will learn about frameworks and strategies for program evaluation. This course is required of all PhD Clinical Psychology students; it is an elective for Psychological Science. 1 Credit

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PUBLIC POLICY AND ADMINISTRATION

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
PA8100	Public Admin & Governance	1
PA8101	Policy Analysis and Challenges	1
PA8102	The State & the Economy	1
PA8103	Research Methods	1
Two elective credits		2
AND one of the following Options:		
THESIS Option:		
Master's Thesis		(Milestone)
MAJOR RESEARCH PAPER Option:		
Major Research Paper		(Milestone)
Two elective credits		2
***COURSE Option**:*		
Four elective credits		4

ELECTIVES		**Credits**
PA8201	Citizen-Oriented Governance in Canada	1
PA8202	Comparative Public Policy	1
PA8203	Comparative Public Admin	1
PA8204	Intergovernmental Relations	1
PA8205	Provincial Government in Ontario	1
PA8206	Urban Governance	1
PA8207	Public Sector Financial Mgmt	1
PA8208	Public Sect Union-Mgmt Relatns	1
PA8209	Chng Boundaries: Third Sector	1
PA8210	Diversity & Equity in the Public Service	1
PA8211	Topics in Public Admin	1
PA8212	Directed Studies: Public Admin	1
PA8213	Co-op Placement	1
PA8214	Topics in Public Policy	1
PA8215	Global Governance	1
PA8216	Intrnational Devlpmnt Policy and Politics	1
PA8217	Ethics and Communication in Public Policy	1
PA8218	Indigenous Law and Pol in Can	1
PA8219	Policy Enrichment Seminar	1
PA8220	Gender, Politics and Policy	1
SS8000	Stat Analysis in Soc Sci Rsrch	1

COURSE LISTING

Master's Thesis
In the thesis option, students conduct an advanced examination of a topic in public policy or public administration. Students propose and carry out the research under the direction of a faculty supervisor and a thesis supervisory committee. On completion, the research is submitted in a thesis format to the supervisor and defended by the student before a thesis examining committee. This is a "Milestone."

Major Research Paper
The research paper option is intended for students following a professional or research-oriented career path in public policy or public administration. Students propose and carry out in-depth research or applied analysis of a policy or public administration issue or problem under the direction of a faculty supervisor and a second reader.
This is a “Milestone”.

PA8100 Public Administration & Governance
This course focuses on the principles, organizational features and decision making processes of Canadian public administration in the broader context of shared governance, public sector reform and globalization. The course covers the relationship between the political and administrative institutions and actors of government; the role of public administration in a diverse democracy; the role of values and ethics in public administration; and the structures and processes of accountability for governance and public sector management. The course also introduces the enduring and current challenges facing public sector organisations and public administrators in Canada. 1 Credit

PA8101 Policy Analysis and Challenges
This course focuses on current challenges in public policy. It situates contemporary Canadian public policy in the environment in which it is lived and developed: first by examining the contemporary context of policy making; secondly by introducing some of the theoretical and methodological underpinnings and tools of policy analysis; and thirdly by examining contemporary challenges faced by policy makers and stakeholders relating to, for example, scale, diversity, global forces, and change. 1 Credit

PA8102 The State & the Economy
This course examines the relationship between the state and the economy and the role that economic ideas have played in shaping this relationship. It is designed for students to understand key economic theories, concepts and practices and the way in which they have influenced public policy and administration, including: critically examining the multifaceted relationship between the state and economy in market society; assessing the usefulness of economic theories for public policy; and uncovering key economic and social science concepts and understanding their uses and limitations. The balance struck between social policy and economic development, will be given special attention with a focus on macro level economic policy analysis. Topics include: the structural and economic context in which state budgeting occurs, the role of federalism and globalization & global institutions such as WTO, in shaping the limits of Canadian public finance, and new economic models and their impact on public policy. 1 Credit

PA8103 Research Methods
This course provides students with an understanding of the range of research methods applicable to public policy and administration, encourages them to think critically about research methods and approaches, and assists them in developing concrete research strategies. The topics covered include research design, quantitative and qualitative modes of inquiry, measurement, statistical analysis, survey research, content analysis, field research, archival and documentation research, the case study approach, and historical and comparative research. The course examines these various methods and statistical techniques in the context of how they are used in public policy and public administration. 1 Credit

PA8201 Citizen-Oriented Governance in Canada
This course examines public decision-making processes in Canada from a citizen-oriented perspective. It begins with an overview of the wider socio-cultural context that gave rise to this model of governance, and follows with an examination of specific engagement practices used in Canada. Throughout the course we will ask: what is the best way to engage citizens and include their views in public policy, and what is the role of public administrators specifically in these processes? 1 Credit

PA8202 Comparative Public Policy
Comparative public policy is the study of how and why different governments pursue particular courses of action or inaction. The course focuses on some of the major theoretical and methodological approaches to the comparative study of public policies and programs, helping students develop the skills needed to study and explain convergence and divergence in government policy and program choice, implementation, and outcomes. The course draws from approaches in comparative politics and policy studies, and uses domestic and global examples to consider and examine the factors that are shaping government decision-making today. 1 Credit

PA8203 Comparative Public Administration
Comparative public administration is the study of how, why and to what effect governments select certain instruments and organizational arrangements to implement policy decisions. These decisions have put public administration at the core of evolving neoliberal definitions of good governance and have resulted in a growing literature on comparative public administration. This course focuses on the varying impact of globalization on developed and developing countries, public sector reform in comparative context, emerging supra-national and global bureaucracies, and the role of international organizations in public administration and public sector reform. 1 Credit

PA8204 Intergovernmental Relations
This course examines the division of political and administrative power and the nature of relations between governments which result from Canadian federalism, including federal-provincial-municipal or "tri-level" relations. Specific topics will include the role of the courts in constitutional interpretations, the instruments of "fiscal federalism” (including equalization payments, conditional grants, tax sharing arrangements and shared cost programs), regional, cultural and linguistic differences, administrative relationships, the intergovernmental challenge of Aboriginal self-government and the concept of "executive federalism". Finally, an investigation of intergovernmental policy capacity will provide an opportunity for a more intensive examination of the impact of intergovernmental relations on public policy and administration in Canada. 1 Credit

PA8205: Provincial Government in Ontario
This course examines both the historical and contemporary development of the government of Ontario, and will include an analysis of economic, social and political features that have shaped the evolution of this province and influenced its governance. Attention is devoted to: the political economy and political culture of Ontario; the determinants and structures of policy making, public administration; public policy fields; and the interaction and roles of government institutions. 1 Credit

PA8206 Urban Governance
Different actors and institutions that span global, national, provincial, and local interests are increasingly making decisions that affect Canadian citizens in their daily lives. Through the lens of contemporary urban policy issues, this course examines the role of urban governance by addressing a selection of current subjects facing Canadian and selected comparative cities. This course explores the interplay of institutions, interests, and ideas in shaping urban governance in the following areas: the evolution of municipal government, finance, employment, immigration, intergovernmental relations, restructuring, civic participation, social inclusion, voluntary sector relations, diversity, and sustainability. 1 Credit

PA8207 Public Sector Financial Management
This course examines public sector budgeting: the raising of revenue, the allocation of expenditures and the evaluation of the efficiency and effectiveness of spending. A central theme of the course is the "politics" of the budgetary process. This includes the process of making budgetary decisions within government, the role of public sector organizations and interest groups in the budgetary process, and how government evaluates its direct spending and monies allocated to fund programs and services delivered by hospitals, schools and other public sector institutions through program evaluation, performance management, auditing and public reporting. The course will focus on what the study of public sector budgeting reveals about changes in the scope and nature of government responsibility and the potential for both greater public participation in the budgetary process and improved accountability. 1 Credit

PA8208 Public Sector Union-Management Relations
Public administration is conducted in a highly unionized environment. Public policies and services, therefore, are significantly affected by union-management relations. This course explores current issues and trends in public sector union-management relations. Particular emphasis is placed on the state's dual role as law-maker and employer, and whether this is compatible with labour rights, diversity and equity, and the public interest. Topics explored include: the rise of public sector unionism, current public sector labour relations legislation, employment restructuring in the public service, and public sector union resistance to government policy. Another major theme of the course will involve an analysis of the changing nature of work, focusing on how new information technologies and public sector reform have affected the distribution of power and control in the workplace with a focus on recent organizational changes in the public sector. 1 Credit

PA8209 Changing Boundaries: The Third Sector
This course offers an in-depth examination of the changing role of the Third Sector in our modern governance structures. Because of the influence of new political developments and public administration reforms such as reinventing government and alternative service delivery (ASD) the Third Sector has taken on a greater importance in society with respect to serving the public good. New partnerships between the state and nonprofit bodies have changed the boundaries in which we have traditionally come to view the public sector. This course will critically assess these developments with public administration and public policy and explore the various roles played by the Third Sector in contemporary Canadian society. 1 Credit.

PA8210 Diversity & Equity in the Public Service
Diversity and equity are important features of public policy and are central to the debate about the renewal of the public service in Canada. An increasing concern with human rights, significant demographic developments, and a citizenry conscious of both the democratic deficit and the need for a representative public service workforce, call into question the values and ethos of public service in Canada. The broader public sector has an opportunity now to make up ground in the representation of historically disadvantaged groups in ways that will help to create an exemplary workplace. The imperative to renew and rejuvenate the public service is matched with the reality of a labour market that is increasingly diverse. The Charter of Rights and Freedoms, the Multiculturalism Act, the federal Human Rights Act and provincial Human Rights Codes have embedded in them a core set of rights, values and responsibilities. Part of the challenge in a democratic society like Canada is navigating between competing rights, claims and values. In this course specific emphasis is devoted to the following policy fields: immigration policy, multiculturalism, native self-government, human rights, employment equity, gender relations and language rights. 1 Credit

PA8211 Topics in Public Administration
This course focuses on selected topics in public administration. The content may vary from year to year. Through an examination of one or more policy areas this course will focus on analyzing the political, legal, social, economic complexities of public administration. 1 Credit

PA8212 Directed Studies: Public Admin
This course is designed for individual students with specialized interests that may not be satisfied through course offerings in a given year. It will normally be a directed reading course under the direct supervision of an assigned faculty member with expertise in the chosen subject field. It is also designed for students wishing to pursue research on a policy or public administration topic where there are no related course offerings in the program. Individual directed study of subject areas in public policy and administration not addressed in the current curriculum will be carried out under the supervision of a faculty member. A program of supervised, advanced study related to the student's area of concentration will be negotiated on an individual basis with the supervising faculty member. The directed study course is normally intended for students in the final semesters of study. 1 Credit

PA8213 Co-op Placement
Co-op placements allow students to earn academic credit for relevant work experience while developing policy-related core competencies. Placements must relate to public policy and administration. This course allows students to link theory with

practice, conduct research, apply critical thinking, learn professional practices in organizations in the public policy and administration field, and gain work experience. Students who choose the co-op option must complete a minimum 180-hour placement to meet course requirements. Pass/Fail. 1 Credit

PA8214 Topics in Public Policy
This course focuses on selected topics in public policy. The content may vary from year to year. Through an examination of one or more policy areas, this course will focus on analyzing the political, legal, social, economic and administrative complexities of various public policies and their implementation. 1 Credit

PA8215 Global Governance
This course examines global governance, a system within which states, international organizations, global actors and networks make critical governance decisions globally. Theories and concepts related to international law, institutions, and actors as well as various global governance challenges related to security, peace-keeping, trade, public health, crime, human rights and the environment will be covered. Particular emphasis focuses on how effective global and international actors and organizations are in terms of policy making and global governance. 1 Credit

PA8216 Intrnational Devlpmnt Policy and Politics
The chief objective of this course is to enable students to acquire a deeper understanding of the processes and structures that shape the character and outcome of policy-making aimed at improving conditions of life in developing countries. The course begins by providing students with some historical and theoretical context to the emergence of international development as a field of study and practice. It then goes on to examine debates around policy-making and implementation in a number of key areas, such as environmental management, gender, education, health, poverty alleviation, agriculture, urban development, and post-conflict reconstruction and aid. 1 Credit

PA8217 Ethics and Communication in Public Policy
This course examines questions of values and ethics in public policy with a special focus on government communication. We will begin by studying ethical conundrums in policy making, as well as the ways in which policy is informed by value conflict. Next, we will turn to the theoretical study of successful and ethical political communication. Finally, we will study communication in practice, developing skills in day-to-day communication and in communications management and strategy. 1 Credit

PA8218 Indigenous Law and Policy in Canada
This course takes a critical look at the legal issues which most affect the lives of Aboriginal peoples, their communities and organizations in Canada. The challenges faced by both Aboriginal and non-Aboriginal governments in addressing legal issues such as Aboriginal and Treaty rights, Aboriginal title, land claims, Aboriginal identity and self-government are often played out in the courts, federalism and the bureaucracy. Some of the legal and policy decisions in Canada have advanced the position of Aboriginal peoples in Canada, while others have hampered progress. These legal decisions also have a significant impact on federal and provincial policies in relation to Aboriginal peoples. Similarly, Aboriginal communities must address these legal issues within their own governments and organizations. The objective of this course is to engage graduate students in thinking critically about these legal issues with a view to advancing their own ideas about how to address the resulting policy implications for Aboriginal and non-Aboriginal governments in Canada. 1 Credit.

PA8219 Policy Enrichment Seminar
This course is designed to enrich students' knowledge of the policy process and enhance career readiness for policy work in the public, non-profit and private sectors. Developed with policy practitioners, modules in the seminar are designed to advance students' capacity for policy work through in-depth analysis of current, high-profile policy case studies using a team-based, skills-focused approach. The emphasis is on enrichment through real-world policy problem-solving, experiential learning, and delivery of presentations to policy practitioners. Pass/Fail 1 Credit

PA8220 Gender, Politics and Policy
Many contemporary policy issues shape women's and men's lives differentially. This course begins with an overview of existing theories of feminism and gender politics and broader sociocultural contexts to frame discussions of the relevance and meaning of feminism, gender, and intersectionality in policy analyses and debates. The course will consider the role of public policy in magnifying and/or reducing disparities in society across multiple axes of marginalization. Issues and topics covered will include gender mainstreaming, gender-based analysis plus (GBA+) and gender budgeting. Some international comparisons will be drawn upon to help contextualize Canada's approach to these issues. 1 Credit

SS8000 Statistical Analysis in Social Science Research
See SOCIAL SCIENCE

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Scriptwriting and Story Design
First offered in Fall 2021

CURRICULUM

Master of Fine Art

DEGREE REQUIREMENTS		Credits
Thesis Project Development		Milestone
Thesis Project		Milestone
SD8010	Elements of Scripted Storytelling	1
SD8011	Script Analysis	1
SD8012	Research Methods for Scriptwriting	1
SD8013	Writing for Visual Media	1
SD8014	Acting and Directing for Writers	1
SD8015	Graduate Writing Seminar 1	1
SD8016	Graduate Writing Seminar 2	1
SD8017	Contemporary Practice in Scriptwriting	1
SD8018	Business of Scriptwriting and SD	1

OPTIONAL ELECTIVES
Students may take up to 2 optional electives from the following --- not required

		Credits
CD8310	Topics in Cross-Cultural Communication	1
CD8320	Media Languages: Forms and Approaches	1
CD8330	Audiences and the Public	1
DM8302	The Culture of Avant-Garde: Modernity's Discontents	1

COURSE LISTING

Thesis Project Development
In the spring term of Year 1, students will work with their thesis supervisor to begin developing the Scriptwriting & Story Design thesis project. Students will explore dramatic context, research themes and develop characterization. By the end of this term, students will have chosen the subject of their final thesis project. This is a Milestone.

Thesis Project
Each student will be expected to individually develop a Thesis, constituting an original contribution to knowledge, which will be demonstrated through script-based projects. The project would consist of one full-length screenplay or stage play, television script, or other dramatic script-based media iteration. Where possible, actors will be brought in to read aloud the work-in-progress to better facilitate its completion. This is a Milestone. Pass/Fail

SD8010 Elements of Scripted Storytelling
This course will investigate the intrinsic nature of story-telling - a beginning, a middle and an end - and how it is animated and driven by emotional connection and specificity of description through character, theme and scripted structure. 1 Credit

SD8011 Script Analysis
Students will examine scripts from the standpoint of the text with the aim to explore how decisions are made from the writer's point of view. Students learn key elements of dramaturgical analysis and understand the nature of the choices and decisions that take a script from the page to the stage or screens. In this course we will be looking particularly at material done in a variety of forms: plays, screenplays and episodic television. 1 Credit

SD8012 Research Methods for Scriptwriting
This course introduces students to research methods and practices that foster socially responsive writing that engages. The course familiarizes students with a variety of information-gathering processes to better prepare them for opportunities in a variety of genres. Students learn the different modalities of practice-based and practice-led research methods, qualitative research, and identify the most appropriate methodological approaches for their projects. 1 Credit

SD8013 Writing for Visual Media
Students will explore commonalities and differences in the forms of screenplay, teleplay, stage-play and a full panoply of emerging digital media. Storytelling approaches include shifting POV, fractured narrative, episodic and layered content. 1 Credit

SD8014 Acting and Directing for Writers
Students acquire a hands-on, working knowledge of acting and directing techniques to develop a better understanding of how scripts are interpreted and "staged." Exercises in scene study, acting methods, and directing deepen students' skills in actor- and director-friendly writing, sharpen their attention to the components of dramatic tension, and increase their capacity for character-driven storytelling. 1 Credit

SD8015 Graduate Writing Seminar 1
In this seminar students develop their Scriptwriting & Story Design thesis project. This will involve feedback from the supervisor, course instructor and other students. By the end of this seminar, students will have a solid outline of their chosen subject and a second reader for their final thesis project. 1 Credit

SD8016 Graduate Writing Seminar 2
With the support of the thesis supervisor, and feedback from the course instructor and other students, the writer will present ongoing drafts of their thesis culminating in a feature-length screenplay, stage play or television script/pilot. This is a class focused - as a key element in successful scriptwriting - on rewriting and revision. 1 Credit

SD8017 Contemporary Practice in Scriptwriting
Students will examine contemporary practices by viewing and analyzing current film, theatre, television and emerging media productions. Guest artists will contribute their unique expertise to helping students articulate the effects of differing creative choices on the scripted piece. 1 Credit

SD8018 Business of Scriptwriting and SD
Students will explore the challenges and opportunities of bringing their scripted works to audiences from a business vantage point. Guest speakers, from industry and the creative community, will lend their expertise in areas such as creative development, financing, production, talent representation and presentation platforms. 1 Credit

OPTIONAL ELECTIVES

CD8310 Topics in Cross Cultural Comm
The term *cross-cultural competence* denotes a vast complex of competencies, which educators, politicians and business leaders around the world have identified as one of the most crucial of the 21st century. The purpose of this course will be to foster such "competence" through a wide-ranging examination of the major social issues that affect communication across national and cultural boundaries. 1 Credit

CD8320 Media Lang: Forms, Approaches
This interdisciplinary course will investigate both common elements (visual and auditory narratives, methods of presentation/distribution, cultural roles) and specific attributes (individual characteristics and technologies) of contemporary media forms. Key developments in the evolution of media types and media languages will be explored in the larger context of understanding critical and theoretical issues associated with these forms and languages. 1 Credit

CD8330 Audiences and the Public
The course addresses the challenges concerning value creation and the effective design and delivery of media/mediated products and services from the perspective of the audience. The course brings an interdisciplinary conceptual framework to bear on contemporary media and mediated consumption to investigate five principal ways of audiencing (citizen, spectator, customer, user and player) as well as the new audience sociability and several key issues around managing it: metrics, presumption, fans, transmedia, and business models. 1 Credit.

DM8302 The Culture of Avant-Garde: Modernity's Discontents
This course explores the discontent that members of vanguard artistic movements of the 20th century harbored relative to the culture of modernity, and examines the different forms that this discontent (or protest) assumed in Futurism, Dada, Surrealism, Lettrism and Situationism. The course examines both key documents in cultural theory and the manifestos issued by various groups, and is concerned particularly with artists who attempted to forge a link between political revolution and a revolution in consciousness. The role the cinema played in all these artistic movements is given special consideration, as is the re- contextualization of this work as a document of its own culture and time. Antirequisite CC8983. 1 Credit

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SOCIAL SCIENCE

SS8000 Stat Analysis in Social Science Rsrch
This course introduces students to advanced quantitative methods for generating and analyzing large social science data sets such as those produced by Statistics Canada and other national and international statistics bureaus. Following a review of basic statistics and probability, the course will cover topics such as the linear probability model, logistic regression, models for categorical and count data and factor analysis. The substantive questions and particular data sets to which these tools will be applied will be driven by student interests. While students will gain knowledge of statistical theory, special attention will be paid to the practice of carrying out analysis of complex data. For example, issues related to coding, missing data and the reporting and presentation of quantitative results will be covered. 1 Credit

SS8001 Advanced Qualitative Methods
This course is specifically targeted at students who want to learn advanced qualitative research methods related to their MRPs, theses or dissertation projects. It will provide advanced understanding and analysis of qualitative research and methods. This course offers an opportunity to customize learning on various qualitative research methods directly related to graduate research projects. 1 Credit

SS8100 Urban Policy
This course is specifically targeted at graduate students from a number of different social science graduate programs who want to gain an understanding of the major urban problems facing cities today and the effectiveness of alternative policy solutions to address those problems. Throughout the course, emphasis is placed on the Canadian case compared to cities around the world. 1 Credit.

SS8200 Justice Policy
Criminal Justice policy is an important part of social policy. This course will provide graduate students with an understanding of criminal justice policy in Canada. This course will consider the process by which justice policies are established, revised, and administered as well as the social and economic issues associated with individual or group involvement in the criminal justice system. This course will provide foundations for further research in the criminal justice field. 1 Credit

SS8300 Contemporary Indigenous Policy
This course examines key issues in contemporary Indigenous policy in Canada. Organized around policy priorities and processes while drawing on the evolution of settler colonial policymaking, students will study and deliberate on the Indian Act and self-government; treaties, Aboriginal rights and land back; negotiation and consultation regimes; as well as justice, education, gender, and child welfare among other areas of reconciliatory policy. Course Objectives. 1 Credit

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SOCIAL WORK

CURRICULUM

Master of Social Work

DEGREE REQUIREMENTS		Credits
Major Research Paper		(Milestone)
SK8103	Research for Social Change	1
SK8104	Practice Research Seminar	1
SK8105	Field Practicum	1
SK8106	Social Work Practice with Black Canadians	1
SK8209	Indigenous Resurgence in SW	1
2 credits from elective list		2

ELECTIVES		Credits
SK8201	Critical Appro Commun Work	1
SK8202	Critc Perspec on Child Welfare	1
SK8203	The Settlemnt Experiencs in CA	1
SK8204	AOP in Health	1
SK8205	Critcl Perspecs on Anti-Racism	1
SK8206	AOP: Sexuality and Gender	1
SK8207	Critical Social Policy	1
SK8208	Indigen Knowldge in Social Wrk	1
SK8210	International Social Work	1
SK8211	Directed Studies	1
SK8212	Criticl Persp on Mental Health	1
SK8213	Socially Engaged Media	1
SK8214	Special Topics in SW	1

Note: students may substitute a relevant course from another graduate program in place of one elective, with the permission of the Program Director.

COURSE LISTING

Major Research Paper
The major research paper provides the students the opportunity to engage in original research. The students engage in critical analysis and knowledge development with respect to social work practice. The paper should include sections on research design, methodology and theoretical development. Findings should apply to both social work practice and future graduate research. Students will be supervised by a professor and papers are to be reviewed by a second reader. This is a “Milestone”. Pass/Fail

SK8103 Advanced Research for Social Change
This course is focused on advanced research methods so that students are prepared to design and engage in original research. This course provides knowledge and skills to conduct research from a critical and interpretive perspective. Students will also have opportunities to understand the contributory role of research in any anti-oppression response to marginalization and in the development of inclusive practices. 1 Credit

SK8104 Practice Research Seminar
In the seminar and practice, students draw upon experience, theory and research in order to advance social work thought and/or develop theory focused practice responses. The seminar engages students in research that advances the knowledge base of anti oppression practice. The professor leads the seminar focused on applied research and theory. Knowledge development is guided by principles of promoting equity and social justice. 1 Credit

SK8105 Field Practicum
Students focus on the synthesis and application of advance anti- oppression social work practice knowledge. The student is expected to apply knowledge gained from practice, theory and research in their advanced practice role within practicum. Students are placed in field placement settings to experience and learn about advanced practice. Student field placements are congruent with the mission of the school and the field of study of the graduate program. 2 Credits. Pass/Fail.

SK8106 Social Work Practice with Black Canadians
This advanced social work course explores the African Diaspora/Black experience globally, focusing on Canada as a Commonwealth State. It emphasizes cultural-centric and Africentric theories, traditions, and clinical frameworks, encouraging students to view Blackness through strength-based, transformative, and liberatory epistemologies. The course critically addresses Canada's settler colonialism and its embedded anti-Blackness, analyzing its impact on individuals, families, and communities. 1 Credit

SK8201 Critical Approaches to Advanced Community Work
This course provides students with a critical understanding of different models and trends of community work in Canada. The course critically analyzes issues that impact marginalized communities in the current political context of social work practice. Through discussions with practitioners and academics, students learn about strategies for building counter power of communities to achieve social change. 1 Credit

SK8202 Critcal Perspectives on Child Welfare
This course critically explores the different aspects that have influenced the relationship between the State and the family through the child welfare systems in Canada. Particular attention will be placed into the overrepresentation of marginalized populations such as racialized, aboriginal, and single mothers within the child welfare system. Discourses of risk, motherhood, and other elements that are relevant to social work interventions will be discussed. Alternative child welfare practices will be also explored. 1 Credit

SK8203 The Settlement Experience in Canada
This course examines the experience of immigrants who have settled in Canada, their integration into Canadian society, and their social processes of marginalisation and exclusion in those experiences. This course considers the lived experiences of immigrants and the practical interventions that may interact with, reproduce or challenge processes of social exclusion. Equitable and anti-oppression approaches to service provision and community development with refugees and immigrants, including social movement and immigrant-based services are explored in-depth. 1 Credit

SK8204 Advanced Anti-Oppression Practice in Health
This course critically explores frameworks used to understand health and its determinants, and to link these to clinical, community, and policy arenas of social work practice. This course examines the different ways that health is conceptualized and implications of each for social work's role. 1 Credit

SK8205 Critical Perspectives on Anti-Racism
This course examines the critical anti-racism perspective as a necessary tool to challenge and dismantle oppressive social relations. The interconnections between social work research, policy, and practice from a critical anti-racism perspective is explored for the purpose of discovering avenues of social change possibilities that challenge the current status quo. 1 Credit

SK8206 Advanced Anti-Oppression Practice in Sexuality and Gender Variance
This course explores current theories and research concerning sexual diversity and gender variance. The focus is on critical examination of the role of social movements, queer and TS/TG theories, community organizations, and social work practices. Students develop advanced skills in critically reflecting upon various social work practices. 1 Credit

SK8207 Critical Social Policy
This course explores historical and current social policy formation within the framework of critical analyses of processes of marginalization, resistance, and state intervention. In addition to gaining a strong grounding in critical social policy literature, students also have opportunities to learn techniques for policy research, policy analysis and program development. 1 Credit

SK8208 Indigenous Knowledge in Social Work
This course explores Indigenous and marginalized knowledge forms in a global context in relation to the area of social work and its implications for social justice and transformative change. It includes a critique of what constitutes "valid" knowledge, helping practices and research methodologies. Questions regarding power, difference, identity, representation and spirituality is emphasized. 1 Credit

SK8209 Indigenous Resurgence in Social Work
This course provides an overview of Indigenous resurgence and activism that informs social work practice and research. The course draws upon the work of Indigenous scholars and social work and Indigenous resurgence literature to critically reflect on the nature and positioning of Indigenous helping practices in the profession. 1 Credit

SK8210 International Social Work
The course focusses upon the impact of globalization, post-colonialism and financial policies adopted by international organizations on the process of development in the countries of the 'South.' The course will critically analyze the social work response to these developments and explore the roles and scope of social work in addressing issues such as poverty, gender inequality and transnational relations. 1 Credit

SK8211 Directed Studies
Students arranges to work with an individual faculty member on a course designed to pursue readings in a specific area that is relevant to social work and/or anti-oppressive practice work with marginalized persons and communities. 1 Credit

SK8212 Critical Perspectives on Mental Health
This course explores ideas, texts, discourses and practices that have contributed to critical social work practice in mental health, introducing students to structural, feminist, aboriginal and post structural perspectives. Framed by anti-oppressive thought, the course

centres voices, histories and approaches often marginalized by biomedical approaches to mental health and illness, using them to re-frame current issues in the field. 1 Credit

SK8213 Socially Engaged Media
Bringing together masters students in Social Work and Documentary Media, this research/creation seminar explores socially engaged practices which privilege collaboration and social interaction in an interdisciplinary dialogue. These practices adopt and borrow from such disciplines as pedagogy, theatre, ethnography, anthropology, art and social work. Through praxis we will explore common methodological problems faced by researchers and practitioners in relation to their subjects and communities. Antirequisite: CD8350. 1 Credit.

SK8214 Special Topics in SW
This course examines selected topics in areas related to the program that are not covered by existing courses. The topic(s) will vary depending on the needs and interests of the students and the instructor. The course description will be announced prior to scheduling the course. 1 Credit

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SPATIAL ANALYSIS

CURRICULUM

Master of Spatial Analysis

DEGREE REQUIREMENTS		**Credits**
SA8902	Database Management and Spatial Technologies	1
SA8903	Applied Spatial Statistics	1
SA8904	GIS Project Mgmt Applications	1
SA8905	Cartography and Geovisualizatn	1
Two elective credits		2
And one of the following Options		
RESEARCH PAPER Option		
	Major Research Paper	(Milestone)
	SA8991 Internship*	1
THESIS Option**		
	Thesis	(Milestone)

**The Thesis Option is only available to fulltime students and is subject to approval by the program. The Thesis Option extends the normal time to completion from three to four or five terms.

ELECTIVES		**Credits**
SA8901	Geospatial Data Analytics	1
SA8906	Spec Topics: Spatial Analysis	1
SA8909	Directed Study in Spatial	1
SA8911	Geodemographics	1
SA8912	Spatial Tech in Strat Planning	1
SA8921	Spatial Analysis of Resources	1
SA8922	Remote Sensing and Spatial Analysis	1
SA8923	Land/Geographic Info Systems	1
SA8931	Community Analytics	1
SA8991	Internship*	1
ES8801	Facl Siting and Env Risk Assessment	1
ES8923	Environmental Assessment	1
ES8925	Dec Making and Stat Plan Mgmt	1
ES8927	Risk Assessment in Envi Mgmt	1
PL8315	Transportation Planning	1
SS8000	Stat Analysis in Soc Science Research	1

* The Internship (SA8991) will be waived for part-time students who are in program-related employment.

COURSE LISTING

Thesis
In the thesis option, students conduct advanced research on a topic in the area of spatial analysis. Students propose and carry out independent research under the direction of a faculty supervisor and monitored by a thesis supervisory committee. Upon completion, this research is submitted in a thesis format to the supervisor, and defended by the student before a thesis examining committee. This is a “Milestone.” Pass/Fail

Major Research Paper
The major research paper is an opportunity for the student to investigate a particular issue or application in his/her field of specialization. Through the research paper, the student demonstrates a critical understanding of the conceptual, methodological, and/or practical aspects of spatial analysis and the ability to conduct independent research. The research topic is selected in consultation with the student’s supervisor and may emanate from class work, research assistantships, or the practicum placement. A research paper proposal is submitted by the end of the Winter term to the supervisor and the program director for approval. Students also share their research projects with the Departmental community in a poster presentation event. The completed research paper is submitted by the end of the Summer term. It is evaluated by a three-person committee, including the supervisor, and is defended in an oral examination. This is a “Milestone”. Pass/Fail.

SA8901: Geospatial Data Analytics
Spatial analysis is characterized by large data volumes and an increasing number of data sources, as most government and business databases include geographic references. This course provides an introduction to geospatial data representation and integration in Geographic Information Systems (GIS). Students gain hands-on experience mapping and analysing real-world datasets, from open government data and the Census to environmental measurements and geolocated social media. 1 Credit

SA8902: Database Management and Spatial Technologies
This course focuses on the core principles of Relational Database Management Systems (RDBMS) and the incorporation of spatial data storage and analytic tools. The course takes an applied approach with extensive use of RDBMS software and business intelligence tools with advanced spatial functionality. Students create entity-relationship models and convert them into GIS-ready spatial databases that make use of techniques such as spatial SQL and spatial indexes.1 Credit

SA8903: Applied Spatial Statistics
This course explores the use of various types of spatial statistical analysis. It involves the application and critical assessment of the use of selected univariate and multivariate modeling approaches in the analysis of geospatial data. Specific topics include spatial autocorrelation, the modifiable areal unit problem, spatial interaction modeling, spatial regression, and identification and interpretation of spatial clusters. 1 Credit

SA8904 GIS Project Management Applications
In this course, student teams are working with external "clients" on medium-scale GIS projects. These case studies will focus on the current and potential use of GIS and related spatial technologies in selected environmental, business, health and government applications. The first part of the course will introduce our external clients and projects, as well as GIS project management approaches. The latter part will require student teams to work independently in coordination with their client and the course instructor, and to report back to the course. Course assignments include a critical evaluation of a previous student project, the writing of a project proposal and a final report, and the oral presentation of progress and results. 1 Credit

SA8905 Cartography and Geovisualization
The course introduces cartographic principles and their application to the design of thematic maps using Geographic Information Systems (GIS). Textbooks and lectures introduce the fundamental elements of cartographic design, different approaches to data representation, and novel map types. The role of maps at different stages of spatial analysis is examined. Students will gain hands-on experience with GIS and statistical software through lab assignments that involve data exploration, analysis, and cartographic presentation. 1 Credit

SA8906 Special Topics: Spatial Analysis
This elective course examines advanced topics in areas related to the program that are not covered by existing courses. It allows students to study current research in spatial analysis and to explore new emerging models of practice. The particular theme, topic and structure of the course will vary in response to trends in the field, availability of specialists, and student interest. The course description will be announced prior to scheduling the course. 1 Credit

SA8909: Directed Study in Spatial Analysis
With the approval of the program director and faculty advisor, students may take the Directed Study course to gain knowledge in an area relevant to their research interests, for which no graduate-level course is offered in a given year. The course permits the student to survey a coherent body of literature in an area of study related to Spatial Analysis. It will normally be a directed reading course under the supervision of a faculty member with expertise in the chosen subject area. A program of supervised, advanced study will be negotiated on an individual basis with the faculty member. Students are required to present the results of one term's work in an organized format. 1 Credit

SA8911 Geodemographics
This course surveys practical, conceptual, and methodological issues associated with the application of spatial techniques to marketing and segmentation. Stress is given to the use of a range of socioeconomic and demographic variables. Methods include multivariate techniques for market definition and segmentation, focusing on applications of cluster analysis. The course also addresses the management issues in the use of geodemographics and related spatial analysis within public and private sector decision-making. 1 Credit

SA8912 Spatial Technology in Strategic Planning
The course examines the application of spatial technologies, particularly GIS, to strategic planning issues that affect the commercial sector of the economy. The focus is on analysis of retail and service activities from the perspective of both the private and public sector policy makers. Specific issues include: spatial impact analyses, use of GIS as a corporate management system, retail and services network planning, and location-allocation modeling. The course will adopt a variety of presentation formats including lectures, seminars and laboratory sessions. 1 Credit

SA8921 Spatial Analysis of Land Resources
This course deals with the spatial modeling and spatial analysis of landscapes and physical/environmental resources. Lectures, seminars, and lab sessions will focus on geospatial landscape modeling, simulation of spatio-temporal processes, analysis of land-use patterns, and GIS-based environmental impact assessment. 1 Credit

SA8922 Remote Sensing and Spatial Analysis
Applications of advanced image processing will be the focus of this course. Remotely sensed data from passive and active remote sensing systems will be examined. Techniques relevant to optical, thermal, and microwave imagery will be investigated with an emphasis on optical data. The objective is to develop an understanding of the principles behind each technique and consider their suitability for different applications. Experience in the processing of remotely sensed data will be gained using image analysis software. The importance of image interpretation will also be emphasized. 1 Credit

SA8923 Land/Geographic Information Systems
Land information refers to any physical, legal, economic or environmental information that concerns land, water, groundwater, subsurface resources, or air. Increasingly, organizations are adopting a Geographic Information Systems approach to data collection and management. The intent of this course is to expose students to the key components required to build and deploy Land/GIS. Topics such as database design, data formats, projection systems, metadata standards will be reviewed in lecture/discussion format. Subsequently, groups of students will be responsible for designing tutorials on data collection methods and tools. The final class project involves field work for data collection and hands-on use of GIS software to deploy a community resource and potential decision-making tool. 1 Credit

SA8931 Community Analytics
This course addresses spatial analysis concepts, techniques, and tools to address program planning and decision-making in the social and community fields. Government and the non-profit sector increasingly rely on large, spatially explicit datasets as evidence in vulnerability and needs assessments as well as predictive analytics. The course draws on real-world application examples in social service delivery, community infrastructure investment, public health, and crime pattern analysis. 1 Credit

SA8991 Internship
The internship is designed to be an unpaid field placement that provides students with an understanding of the types of problems, policies, and procedures that involve spatial analysis in specific public or private sector environments. The internship will be arranged by the program director in discussion with the student. Students will work for two days per week for the duration of one term. The placement is evaluated through a practicum report of 8-10 pages. The report presents the current role and expected development of spatial analysis in the placement organization; describes the student's tasks during the placement; and compares the practicum experience with the academic view of spatial analysis. The student may also be subject to an oral examination about the internship experience by the program director and faculty advisor in consultation with the internship host. Pass/Fail. 1 Credit

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URBAN DEVELOPMENT

CURRICULUM

Master of Planning

DEGREE REQUIREMENTS		**Credits**
	Two-Year Stream	
Major Research Paper or Project		(Milestone)
PL8100	Phys Planning Dsgn Fundmtls	1
PL8101	Diversity and Inclusive Planning	1
PL8102	Inst Legal Context of Planning	1
PL8103	Finance and Local Governance	1
PL8104	Advanced Research Methods	1
PL8105	Planning for Sustainability	1
PL8106	Prof Practice and Ethics	1
PL8107	Planning Internship	2
PL8108	Adv Theories of Planning	1
PL8109	Planning Studio	2
PL8110	Adv Planning Studio	2
Three elective credits		3

Accelerated One-Year Stream		**Credits**
Major Research Paper or Project		(Milestone)
PL8101	Diversity and Inclusive Planning	1
PL8104	Advanced Research Methods	1
PL8105	Planning for Sustainability	1
PL8108	Adv Theories of Planning	1
PL8109	Planning Studio	2
PL8110	Adv Planning Studio	2
Two elective credits		2

ELECTIVES		**Credits**
Urban Development		
PL8301	Planning, Design Creative City	1
PL8302	Landscape Urbanism	1
PL8303	Retrofitting Suburbs	1
PL8304	Housing and Redevelopment	1
PL8305	Contemporary Urban Design	1
PL8306	Heritage/Cultural Regeneration	1
PL8307	Ecological Design	1
PL8308	Social Justice in Planning	1
PL8309	Urban Investments	1
PL8310	Waterfront Cities	1
PL8311	Directed Study	1
PL8312	Spec Topics I: Urban Planning	1
PL8313	Nature as a Cultural Construct	1
PL8314	Spec Topics II: Urban Planning	1
PL8315	Transportation Planning	1
PL8316	Site Planning	1
PL8317	Environmental Planning	1
PL8318	Advanced Site Planning	1
PL8319	Brownfields and Sustainable Development	1

The following electives from other graduate programs require Graduate Program Director approval; spaces are limited.

Architecture

AR8204	Architecture in Public Policy	1
AR8205	The Architecture of Urban Housing	1
AR8214	Heritage Conservation Theory and Practice	1

Communication and Culture

CC8928	Culture and the Environment	1
CC8932	Communication, Culture and the City	1
CC8945	Political Commun. & Env. Issues	1
CC8954	New Social Movements	1

Environmental Applied Science and Management

ES8801	Facility Siting and Environmental Risk Assessment	1
ES8910	Energy and the Environment	1
ES8922	GIS for Environmental Management	1
ES8923	Environmental Assessment	1
ES8925	Decision Making/Strategic Planning in Mgt.	1
ES8926	Environmental Economics	1
ES8927	Risk Assessment in Environmental Mgt.	1

Immigration and Settlement Studies

IS8922	Changing Multicultural Mosaic of the GTA	1
IS8925	Global Migration & Population Movements	1
IS8926	Women, Immigration, and Settlement	1

Public Policy and Administration

PA8201	Citizen Oriented Governance & Globalization	1
PA8206	Urban Governance	1
PA8207	Public Sector Financial Management	1

Social Sciences

SS8000	Statistical Analysis for Social Science Data	1
SS8001	Advanced Qualitative Methods	1
SS8100	Urban Policy	1

Course Descriptions

Major Research Paper or Project
This capstone course in the Master's program allows each student to undertake a self-directed original research paper or applied project involving advanced research and analysis on a major issue, case or site in contemporary urban planning, design and development. Major papers will involve the identification of a research problem with appropriate primary and secondary research methods, data collection and analysis. Major projects will involve the development of an original applied design solution for a particular site or case in contemporary urban planning and design. Pass/Fail. Milestone

PL8100 Physical Planning and Design Fundamentals
This foundation course introduces graduate students to the theory, methods and practice of physical design for urban areas. Classes involve a variety of teaching and learning approaches including lectures, seminars, and case studies in built form, relying on both historical and contemporary urban precedents from around the world. 1 Credit

PL8101 Diversity and Inclusive Planning
It is imperative for planners to understand growing urban diversity and instill the values of equity and inclusion into planning policies and practices. This course explores the concept of diversity along different dimensions (e.g. race, ethnicity, indigeneity, class, age, gender, religion, ability, sexuality) and the roles of planners in inclusive city and community-building. It aims to provide students with a theoretical, ethical and practical foundation to support inclusive planning. 1 Credit

PL8102 Institutional and Legal Context of Planning
Through a series of case studies in practice, this course offers students a foundation in the legal and institutional context in which planning is practised as a registered profession in Ontario. Relevant statues covered will include: Planning Law, The Planning Act, the Places to Grow Act, the Greenbelt Act, the Environmental Protection and Assessment Acts, the Charter of Rights and Freedoms, as well as related policies such as Smart Growth, growth management, Environmental Bill of Rights, etc. The course is taught in combined lecture-seminar format, with students working in teams to debate in moot court, various planning decisions in the context of pertinent statues and policies. 1 Credit

PL8103 Finance and Local Governance
This course grounds students in urban economics and mechanisms of finance used in the development, regeneration and revitalization of contemporary urban regions. Through a series of seminars and case studies in practice, students will critically assess and analyze a range of instruments in urban finance and local governance, including for example, tax increment financing, density bonuses, development charges, land transfers, land swaps etc. 1 Credit

PL8104 Advanced Research Methods and Analysis
This course covers the use and application of quantitative (both descriptive and inferential statistical) techniques in combination with various qualitative research methods used by planners. The course emphasizes in particular, the selection and combination of research methods and instruments appropriate to urban development research and urban design problems typically investigated within an applied planning context. 1 Credit

PL8105 Planning for Sustainability
This course explores the theory and applications in practice of planning for sustainability in the context of an urban cultural-natural landscape. Presenting various theoretical fundaments of sustainability – from socio-political to ecological – this course uses a combination of seminars, lectures, debates and case studies to explore the ways in which planning for sustainability may be articulated and manifested in policy, legislation, governance, civic engagement and built-form in the city. 1 Credit

PL8106 Professional Planning Practice and Ethics
This course establishes the professional context for an urban planning practice through seminar discussions and case studies centered on the ethics of planning decisions and design solutions in various applied examples. Using the professional codes of the planning profession in Canada, graduate students will engage in critical reflection and debate, and learn techniques for facilitating ethical planning and decision-making under the complex conditions that increasingly characterize contemporary planning practice, including, for example, public-private developments, multi-disciplinary practices, joint ventures and community-led planning.
1 Credit

PL8107 Planning Internship
In this course, students will be expected to gain a minimum six-week professional experience with planning agencies and community organizations. This learning experience will enrich and advance students' practical knowledge of planning and prepare them for the workplace. The course will provide opportunity to gain exposure to a range of practical, organizational, political and professional issues. Students will be expected to find placements in consultation with the Instructor. Pass/Fail. 2 Credits

PL8108 Advanced Theories of Planning and Design
This course covers established, current and emerging theories of planning in the interdisciplinary context of urban development, and draws from planning and related literatures, including urban planning, urban design, sociology, political science, philosophy, and decision theory. Theories of contemporary city-building are examined from their historical origins to provide an understanding of the changes in the theories that have guided planning and urban development. It critically reviews the theoretical ideas that have informed planners and shaped urban development, and it examines the rationales for planning in contemporary urban environments. 1 Credit

PL8109 Planning Studio
This core studio forms the backbone of planning theory and techniques in practice, with an emphasis on integrating the two literacies - multiculturalism and ecology in planning and design. Through experiential learning and applied planning and design techniques, graduate students will study urban precedents from various metropolitan regions, critically assess these cases, and from these analyses, critically consider planning alternatives for a local site, develop strategies for implementation or policy issue in the context of contemporary urban development. Working in small groups, students will present their work in weekly critiques, a mid-term design charrette, and final project reviews presented to a jury of invited critics. 2 Credits

PL8110 Advanced Planning Studio
This core studio builds on planning theory and techniques in practice from MPL 101. Through a combined studio and advanced scholarly seminar format, graduate students will undertake experiential learning and (pure or applied) scholarly research to advance the study of the topics of their choice, critically assess, and present their explorations and analyses in the class. The combination studio-seminar format will afford a diversity of teaching and learning approaches including the opportunity for primary researchers, speculative designers, and professionals in practice to share their work with students. This forum will advance students' scholarship of design and planning practice through intensive and rigorous focus on a selected site, policy or precedent together with important technical and supporting scholarly knowledge. 2 Credits

PL8301 Planning and Designing the Creative City
This subject investigates the concept of the 'creative city' as an emerging urban phenomenon that requires new approaches by planning decision-makers. Through exploring the theories of, and links between contemporary arts and culture, cultural planning, urban regeneration and the rise of the knowledge economy, this course considers means and precedents for the planning and design of creative cities. Students will critically assess how cities shape and are shaped by economic and socio-cultural forces, and in turn, consider means by which a contemporary urban planning agenda can manifest innovative ideas and approaches. 1 Credit

PL8302 Landscape Urbanism
Current social and environmental conditions pose significant design challenges to growing metropolitan regions. As a response to these conditions, this course explores theories of urbanism in relation to landscape, which has become a central organizing force in contemporary urban development, and through which the traditional duality of culture and nature is dissolving. The notion of landscape as a complex system and a dynamic, responsive surface is investigated as the basis for understanding and continuously reconfiguring the contemporary city. Through critical analysis of key precedents in large-scale designs, students will consider new modes of practice and emerging strategies to engage directly with the dynamic conditions that characterize today's urban areas.
1 Credit

PL8303 Retrofitting Suburbs
Our current pattern of low density, automobile dependent, single land use urban form is widely recognized as no longer being sustainable. Yet suburban and exurban growth patterns have largely defined urban built form of the late 20th and early 21st centuries. Can the suburbs be retrofitted to intensify and diversify land uses, and to meet the social and economic challenges that accompany this growth pattern? Can transit be viable and housing sustainable? Can suburban ecosystems and landscapes be redesigned or regenerated?? This course will respond to these questions through a series of analytical case studies, speculative policies, and creative design projects. 1 Credit

PL8304 Housing and Redevelopment
Regent Park, the Toronto Waterfront, Lawrence Heights – these neighbourhoods in Toronto represent the next frontiers for innovative urban redevelopment. This seminar explores current issues and challenges in housing through an exploration of related literatures on homelessness, poverty, and neighbourhood creation, with associated study of precedents in residential building form. This course will examine the past, present and future of housing issues in urban redevelopment with an emphasis on developing new viable housing typologies that are affordable, sustainable, and well-designed for contemporary urban vitality. 1 Credit

PL8305 Contemporary Urban Design
This course will assess a number of cities in Canada and elsewhere and the various arrangements of urban form that affect perceptual experiences. Urban design considers the location of structures, open space, movement channels, and methods of implementing public policy decisions affecting urban design. This course will introduce students to the theory and practice of urban design, especially, the contemporary form of urban design through readings, lectures, discussions, and project work. 1 Credit

PL8306 Heritage and Cultural Regeneration
Heritage- and culture-based initiatives are essential to urban regeneration programs in Canada. Heritage and culture take on many forms: painting, writing, quilting, pottery, museums, landmarks, sculptures, landscapes, streetscapes, memorials, sport. It is a way for individuals and communities to express and engage themselves with family, friends, and their neighbourhoods, their communities. Culture can be used to renew or revitalize municipalities, regions, even a country. Through case studies in Canada and across the world, literature review and class discussions, the seminar will explore heritage- and culture-based regeneration.
1 Credit

PL8307 Ecological Design
This course will examine critically and in depth the concepts, theory and practice of ecological design. It will explore the interface between ecological science and land use planning in the context of design for sustainable developments. Through lectures, seminars, and practical exercises tied to specific sites, students will examine how the interdependent and dynamic relationship between ecology and planning can be creatively harnessed in the design of urban landscapes and their built forms. 1 Credit

PL8308 Social Justice in Planning
The course offers a forum to examine the links between planning and social (in)justice, especially planning's role in creating more equitable and inclusive communities amidst growing diversity. It explores both the dark side of planning and its transformative potential, placing special emphasis on the links between planning and Indigenous dispossession. Students are invited to consider the implications of that history for planning today and what social justice means in settler colonial contexts. 1 Credit

PL8309 Urban Investments
The course examines urban investment strategies that integrate market-based solutions into the urban development process to promote local and regional planning objectives. Real estate investment terminology, data, financial analysis techniques and spreadsheet-sheet based applications are covered to learn about the feasibility analysis process associated with income-property investments. Case studies, in-class exercises, lectures and guest speakers provide the opportunity to address contemporary urban development issues. Antirequisite: PLE635. 1 Credit

PL8310 Waterfront Cities
Worldwide, waterfront cities share common opportunities and challenges in urban planning and design, ranging from contamination remediation to public space creation and asset enhancement. The revitalization and redevelopment of waterfront cities require planners to adeptly respond to these and other social, ecological, cultural and economic issues at local, state and global scales. Through policy analyses and case studies in Toronto and abroad, tools for planning and designing vibrant waterfront cities are investigated. Students will explore and analyse a range of post-industrial waterfronts – transitional and derelict spaces, from ports, to ship yards and docklands – considering a range of planning and design solutions being used in the regeneration of these spaces. 1 Credit

PL8311 Directed Study
This course is available to graduate students who wish to gain knowledge in a specific area of planning and design for which no graduate level course offerings are available. This would involve a directed study for which the student(s) would be given one credit. Students will conduct their studies under the supervision of an assigned faculty member with expertise in the chosen subject area. Students can take this course only once during their stay in the program. Registration in and requirements of the course must be approved by the Program Director. 1 Credit

PL8312 Spec Topics I: Urban Planning
This course provides students with the opportunity to pursue advanced studies on issues and themes of immediate and current significance in the fields of Planning and Design. It allows students to access leading-edge research and to explore new and emerging models of practice. The particular theme, topic and structure of the course will vary in response to changes and trends in the field, availability of specialists and student interest. 1 Credit

PL8313 Nature as a Cultural Construct
This seminar course focuses on the idea of nature as a cultural construct. The meaning, use and understanding of nature are closely tied to contemporary cultural norms, human behaviour patterns, and social and political ideologies. The seminar examines nature as a cultural construct through a number of lenses: ideas of nature versus wilderness, historical concepts of nature and environmentalism, nature as a manifestation of colonialism, nature as artistic expression, nature as ideal and norm, and the relationship of nature to the city. 1 Credit

PL8314 Spec Topics II: Urban Planning
This course may be offered in response to students' needs and interests. Topics may relate to a dimension of planning and design that is not covered in existing courses including Special Topics I. The particular theme, topic and structure of the course will vary in response to changes and trends in the field, availability of specialists and student interest. 1 Credit.

PL8315 Transportation Planning
This course focuses on the concepts, methods, emerging issues related to the planning of urban transportation systems. Topics include transportation policy in the TO region, UTMS & other methods of analyzing urban transportation, and the links between transportation, land use, health, equity & environmental justice. Particular emphasis is placed on understanding household travel demand. Relationship between traveller behaviour & the urban (built) environment will be critically explored. 1 Credit.

PL8316 Site Planning
This advanced level course provides students with the opportunity to work through the planning and design process for several distinct land uses on singular urban sites. The emphasis will be on the design of suitable development proposals and their disposition on a typical urban site. Students will have the opportunity to test their understanding of the cultural, environmental, engineering, technical, administrative, regulatory, and aesthetic factors which influence design and plan approval processes. Antirequisite: PLE555. 1 Credit.

PL8317 Environmental Planning
This course is an introduction to environmental planning for graduate students. It begins with a concentration on the theories of contemporary environmental planning and related practice in Ontario and moves to focus specifically on the Toronto municipal environmental planning context. The course provides a broad overview of the provincial and municipal context and the role of the planner within these and examines the role of the advocate and private sector in the field of environmental planning. 1 Credit

PL8318 Advanced Site Planning
This course offers students the opportunity to advance their competencies in planning lands at the site scale. Students will attain skills appropriate to function in a municipal or provincial planning setting or within a private sector firm. Students will develop a leading edge knowledge of the regulations that direct the practice of land planning in Ontario. Students will be challenged to develop viable design alternatives for specific urban sites given their economic, ecological and existing uses characteristics. 1 Credit

PL8319 Brownfields and Sustainable Development
The remediation and reuse of potentially contaminated brownfields is vital to urban sustainability. This course reviews the theory and practice of brownfields redevelopment focusing on key issues related to history, regulation, liability, site assessment/cleanup, project planning, development, and funding. The course aims to provide students with a foundation to pursue a brownfields career with government or the property development industry. Antirequisite: PLE865 1 Credit

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Urban Health

CURRICULUM
First Offered Winter 2021

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
Comprehensive Examination		(Milestone)
Dissertation		(Milestone)
UH9010	Theories and Concepts in Urban Health	1
UH9011	Research in Urban Health Settings	1
UH9012	Seminar	1
UH9013	Data Analysis	1
One Elective		1

ELECTIVES		Credits
CY 8004	CYC Management and Policy Development	1
MN 8901	Quantitative Research Methods	1
MN 8902	Qualitative Research Methods	1
MN 8910	Health and Illness: Theoretical Perspectives	1
MN 8911	Population Health and Health Promotion	1
MN 8920	Health Policy: A Comparative Analysis	1
MN 8921	Leadership in Education	1
MN 8931	Diversity and Globalization: Promoting Urban Health	1
MN 8934	Interprofessional Health Education	1
MN 8935	Theory and Practice of Program Planning and Evaluation	1
MN 8936	Advanced Therapeutic Communication	1
NC 8101	Appraising Scientific Evidence	1
NC 8102	Understanding Health Behaviour	1
NC 8103	Nutrition Communication Strategies	1
NC 8201	Food and Nutrition Policy	1
NC 8209	Knowledge Translation	1
PL 8304	Housing & Redevelopment	1
PL 8305	Contemporary Urban Design	1
PL 8314	Parks in the Contemporary City	1
PL 8315	Transportation Planning	1
PL8317	Environmental Planning	1
SK 8212	Critical Perspectives on Mental Health	1

Course Listing

UH9010 Theories and Concepts in Urban Health
This course will review theoretical issues relating to urban health that include: health equity, primary health care, and urban health systems. Specifically, principles pertaining to the development and testing of theories and concepts will be presented. Students will be expected to demonstrate a critical analysis of the relevance and applicability of urban health theories and concepts throughout their assignments. As well, the inter-relationship between major global trends, municipal level determinants, urban living conditions, urban health systems, and outcomes will be examined and applied to inter-disciplinary based case studies and small group activities. 1 Credit

UH9011 Research in Urban Health Settings
This course will examine the issues, strengths, and opportunities that arise through interdisciplinary team research, as well as specific methodological issues that commonly arise in urban health research (e.g., recruitment of hard-to-reach samples, obtaining consent, collecting data, measurement, strategies to enhance enrollment and completion of research among diverse populations).Students will engage in activities that include: creation of a report of a research study derived from existing datasets and/or qualitative data (e.g. faculty members own research or data available at the local, provincial or federal level), as well as evaluation of study quality and rigor using a defined framework reflective of the study methodology. 1 credit

UH9012 Seminar
Students will be required to attend a seminar every other week, during their first year. The goals are to 1) promote inter-professional collaboration in the understanding of urban health concerns and issues and in generating relevant solutions; and 2) socialize students and prepare them to assume the role of clinical scientist. The seminar will involve meaningful academic activities, including guest presentations on topics related to Issues pertaining to Urban Health and Interprofessional Collaboration; student presentations of their collaborative work in understanding and finding solutions to urban health concerns; and participating in class-based collaborative reviews of papers and proposals. 1 Credit

UH9013 Data Analysis in Urban Health Research
This course focuses on the theory, techniques and issues of data (quantitative and qualitative) analysis and interpretation. Topics addressed include points of focus in analyzing text data, tools for helping to analyze data (summaries, self-memos, and research diaries), and common qualitative (thematic content, narrative, and discourse analyses) and quantitative descriptive (chi-square and regression) and inferential (t-tests, analysis of variance, structural equation modelling) analyses. Students are expected to have their own data to work with, ideally from their own dissertation projects. 1 Credit

For course descriptions of non UH courses, go to the Program offering the course. CY – Child and Youth Care MN – Nursing NC – Nutrition Communication PL – Urban Development SK – Social Work

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