RYERSON UNIVERSITY

Yeates School of Graduate Studies
2016/2017 Calendar

IMPORTANT NOTICE

Ryerson University reserves the right to change, without notice, any information appearing in this Calendar pertaining to the requirements for the continuation of study in, and the requirements for the granting of degrees in any of its graduate programs. Ryerson reserves the right to withdraw or cancel programs or courses that are under enrolled. Ryerson reserves the right to make such changes in rules, regulations and promotional policies as may be required.

Course descriptions are provided in this 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 listing in the Calendar or from other course management information made available.

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.

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 Ryerson/York Communication and Culture Program.

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	1

AE8144	Comp Meth in Aero Analysis	1
AE8145	Nanomaterials and Nanocomposite	1
AE8146	Applied Aerodynamica	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 imilarity 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. Twodimensional 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 class is available to graduate students enrolled in a Master's Degree Program in Mechanical 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. 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
Students will review the basics of digital systems architecture, real-time analysis and network theory. The role of sensors, processing, displays and actuators will be examines. Modern aircraft and spacecraft avionics systems will be studied, with particular emphasis on predicting performance and reliability. 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

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

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
	Six electives from the Electives list or the remaining Foundation course and five electives	6

Doctor of Philosophy in Mathematical Modelling and Methods

DEGREE REQUIREMENTS		
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
AM9000	PhD Seminar	1
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	Operations Research	1
AM8212	Introduction to Fluid Dynamics	1
AM8213	Financial Mathematics II	1
AM8214	Computational Complexity	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

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 student, faculty members, visiting scholars, and guest speakers. In order to pass this course, each student is normally expected to attend all seminars during each term in the program, 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 Operations Research
Nonlinear Programming, Decision Making, Inventory Models, Markov Chains, Queuing Theory, Dynamic Programming, Simulation. Antirequisite: MTH603 1 Credit

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. Anti requisite: MTH814 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 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. 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.

ARCHITECTURE

CURRICULUM

Master of Architecture

DEGREE REQUIREMENTS		Credits
Masters 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
AR8105	Intensive Research Studio and Seminar	4
AR8106	Current Topics in Architectural Praxis	1
Two Elective Credits		2

Electives		Credits
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

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

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 is meant to offer students a theoretical basis for working in or operating an architectural practice in the twenty-first century. Topics will include the legal framework for architectural practice, the role of internship, basic financial management of a practice, management and leadership principles, and so on. All aspects are presented from a critical rather than a prescriptive viewpoint: students will be asked to examine current structures of practice and propose alternative versions. Alternative forms of practice, including the Integrated Design Process, will be discussed. 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

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. 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 between 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 globilization 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. 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 ensue 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.

BIOMEDICAL PHYSICS

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		(Milestone)
BP8102	Medical Diagnostic Techniques	1
BP8103	Fndamntls of Radiation Physics	1
BP8201	Master's Seminar I	Pass/Fail
BP8202	Master's Seminar II	Pass/Fail
Two* credits from elective list *For students electing the Option in Medical Physics, only one (1) elective is required		2

Option in Medical Physics
(first offered in Fall 2013)

Degree Requirements for Master of Science plus:

CAMPEP -- Clinical Shadowing		Milestone
BP8104	Radiation Therapy	1
BP8107	Radiation Protection and Dosimetry	1
BP8112	Radiobiology	1
BP8113	Advanced Imaging	1
BP8114	Anatomy and Physiology for Medical Physicists	1

AND as required to meet CAMPEP accreditation requirements

CAMPEP – Medical Diagnostic Techniques	Milestone
CAMPEP – Fundamentals of Radiation Physics	Milestone
CAMPEP – Radiation Therapy	Milestone
CAMPEP – Radiation Protection and Dosimetry	Milestone
CAMPEP - Radiobiology	Milestone

Doctor of Philosophy

First Offered Fall 2011

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
Two credits from elective list		2
Up to two additional credits, if necessary**		Up to 2

Option in Medical Physics
(first offered in Fall 2013)

Degree Requirements for Doctor of Philosophy plus:

CAMPEP -- Clinical Shadowing		Milestone
BP8102	Medical Diagnostic Techniques	1
BP8103	Fundamentals of Radiation Physics	1
BP8104	Radiation Therapy	1
BP8107	Radiation Protection and Dosimetry	1

BP8112	Radiobiology	1
BP8113	Advanced Imaging	1
BP8114	Anatomy and Physiology for Medical Physicists	1

AND as required to meet CAMPEP accreditation requirements

CAMPEP – Medical Diagnostic Techniques	Milestone
CAMPEP – Fundamentals of Radiation Physics	Milestone
CAMPEP – Radiation Therapy	Milestone
CAMPEP – Radiation Protection and Dosimetry	Milestone
CAMPEP - Radiobiology	Milestone

Elective List		**Credits**
BP8101	Stats for the Health Sciences	1
BP8104	Radiation Therapy	1
BP8105	Comp Methods in Biomed Phys	1
BP8106	Optcl, Acstc and Thrmal Phys	1
BP8107	Rad Protection and Dosimetry	1
BP8108	Special Topics I	1
BP8109	Special Topics II	1
BP8110	Biomedical Ultrasound	1
BP8112	Radiobiology	1
BP8113	Advanced Imaging	1
BP8114	Anatomy and Physiology for Med. Phys.	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.

**For example, a student may be assigned BP8102/BP8103 to ensure adequate background in Radiation Physics and Medical Imaging.

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." Pass/Fail

Doctoral Dissertation
Students are required to conduct advanced research in the area of Biomedical 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 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
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 communicaton, experimental design and scientific thought processes, as well as a sound understanding of the specialty area associated with the research. This is a "Milestone." Pass/Fail

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. The duration of each component can range from 2 hours to 2 half-day sessions. 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. No more than two students can participate in the same 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." Pass/Fail

CAMPEP – Medical Diagnostic Techniques
The student should have successfully completed the CAMPEP accredited version of BP8102 (Medical Diagnostic Techniques). For students who successfully completed a previous version of BP8102 in the Biomedical Physics program will have to complete and pass any components in the CAMPEP accredited version that were missing in the course they took. Students who took an anti-requisite of BP8102 will have to complete and pass any components in the CAMPEP accredited version that were missing from the anti-requisite course they took. This is a "Milestone." Pass/Fail

CAMPEP – Fundamentals of Radiation Physics
The student should have successfully completed the CAMPEP accredited version of BP8103 (Fundamentals of Radiation Physics). For students who successfully completed a previous version of BP8103 in the Biomedical Physics program will have to complete and pass any components in the CAMPEP accredited version that were missing in the course they took. Students who took an anti-requisite of BP8103 will have to complete and pass any components in the CAMPEP accredited version that were missing from the anti-requisite course they took. This is a "Milestone." Pass/Fail

CAMPEP – Radiation Therapy
The student should have successfully completed the CAMPEP accredited version of BP8104 (Radiation Therapy). For students who successfully completed a previous version of BP8104 in the Biomedical Physics program will have to complete and pass any components in the CAMPEP accredited version that were missing in the course they took. Students who took an anti-requisite of BP8104 will have to complete and pass any components in the CAMPEP accredited version that were missing from the anti-requisite course they took. This is a "Milestone." Pass/Fail

CAMPEP – Radiation Protection and Dosimetry
The student should have successfully completed the CAMPEP accredited version of BP8107 (Rad Protection and Dosimetry). For students who successfully completed a previous version of BP8107 in the Biomedical Physics program will have to complete and pass any components in the CAMPEP accredited version that were missing in the course they took. Students who took an anti-requisite ofBP8107 will have to complete and pass any components in the CAMPEP accredited version that were missing from the anti-requisite course they took. This is a "Milestone." Pass/Fail

CAMPEP – Radiobiology
The student should have successfully completed the CAMPEP accredited version of BP8112 (Radiobiology). For students who successfully completed a previous version of BP8112 in the Biomedical Physics program will have to complete and pass any components in the CAMPEP accredited version that were missing in the course they took. 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. This is a "Milestone." Pass/Fail

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

BP8102 Medical Diagnostic Techniques
This course will cover a wide variety of contemporary topics in medical imaging including x-ray imaging (production, planar x-ray, fluoroscopy, dual x-ray absorptiometry), computed tomography (CT), functional CT, magnetic resonance imaging (temperature mapping, functional MRI), ultrasound, Doppler techniques, positron emission tomography, bone densitometry, trace element detection and nuclear medicine. Antirequisite: PCS405. 1 hour lab/week. 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

BP8106 Optcl, Acstc and Thrml Phys
The course will begin with basic optical, acoustic and thermal propagation in biomaterials. This will be followed by the presentation of the principles of photodynamic therapy, optical sensing, ultrasound biomicroscopy, optoacoustics imaging, thermal therapy and thermography. 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. 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

BP8113 Advanced Imaging
This advanced level course will include mathematical methods in imaging science (linear systems and image processing), image reconstruction techniques for CT, cone-beam CT, PET and MRI, and MRI imaging. Image registration, Rose Model, ROC curves, signal-to-noise ratio, and DQE will also be discussed. Prerequisite: BP8102 or equivalent. 1hour lab/week. 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

BP8201 Master's Seminar I
This course consists of weekly seminars with emphasis on current research in the specialization fields and emerging areas of medical 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 emphasis on current research in the specialization fields and emerging areas of medical 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 emphasis on current research in the specialization fields and emerging areas of medical 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 emphasis on current research in the specialization fields and emerging areas of medical 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 emphasis on current research in the specialization fields and emerging areas of medical 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 emphasis on current research in the specialization fields and emerging areas of medical 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.

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

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
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

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

CHEMICAL ENGINEERING

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS	Credits
Master's Thesis	(Milestone)
Master's Seminar	(Milestone)
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)
Doctoral Seminar	(Milestone)
Four Elective credits from Group I	4

ELECTIVES

Group I		Credits
CE8139	Prob, Stat and Stochastic Proc	1
CE8140	Statistics for Engineering	1
CE8201	Model and Simulation- Chem Eng	1
CE8202	Advanced Process Control	1
CE8203	Applied Optimal Control	1
CE8204	Advanced Modeling Techniques	1
CE8213	Advanced Numerical Methods	1
CE8301	Advanced Transport Phenomena	1
CE8303	Advanced Fluid Dynamics	1
CE8304	Rheology	1
CE8401	Ind Catalysis and Biocatalysis	1
CE8402	Applied Thermodynamics	1
CE8403	Advanced Reactor Engineering	1
CE8501	Polymer Science	1
CE8502	Polymerization Reaction Engr	1
CE8602	Industrial Biotechnology	1
CE8603	Advances in Biomaterials	1
CE8604	Advances in Porous Materials	1
CE8605	Nanobiotechnology	1
CE8606	Advanced Topics in Tissue Engineering	1
CE8702	Dsgn/Oper Sm Wtr Treat Plants	1
CE8703	Adv Water Treatment Tech	1
CE8803	Advanced Food Process Engineering	1
CE8100	Directed St: Chem Eng (MASc)	1
CE9100	Directed St: Chem Eng (PhD)	1
Group II		
CE8210	Process and Engr Optimization	1
CE8310	Fluidization Engineering	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

Master's Seminar
This course consists of presentations by graduate students, faculty members, visiting scholars, and guest speakers. In order to pass this course, the MASc student is required to attend all seminars while in the program and give one presentation towards the end of his/her thesis. 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

Doctoral Seminar
This course consists of presentations by graduate students, faculty members, visiting scholars, and guest speakers. In order to pass this course, the PhD student is required to attend all seminars while in the program, and give one presentation before his/her candidacy exam and one presentation towards the end of the dissertation. This is a "Milestone." 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

CE8139 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, ME8139. 1 Credit

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

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

CE8204 Advanced Modeling Techniques
Terminology; Model development cycle; Classification. Conservation Laws; Equations of change; Equilibrium conditions. Constitutive relations: Transport of mass, energy and momentum. Reaction kinetics; Thermodynamic relations; Empirical correlations; Dimensional analysis. Model Formulation: Assumptions; Geometry; Mathematical relationships. Model simplification: Scaling; Ordering analysis; First order approximation; Deviation variables. Model transformation. Model simulation algorithms. 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

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

CE8310 Fluidization Engineering
Introduction to the Unit Operation. The phenomenon and its industrial relevance. Determining variables. Intervals and their effect. Two-phase and three-phase fluid beds. Entrainment, Elutriation and TDH. Introduction to pneumatic transport. Gas-solid separators. Chemical reactors. Combustion in fluid beds. Circulating and pressurized fluid beds. Transport phenomena: Heat and mass transfer. Design of fluid bed processes and their components. Current fluid bed technology. Experimental innovations. Extra project/assignments are required, weighing no less than 20-30% of the final grade. Antirequisite CHE427 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

CE8401 Kinetics of Ind. Catalysis & Biocatalysis
Homogeneous catalysis reactions such as acid-base catalyses, ion catalyses, enzyme catalyses, chain reactions and polymerization will be considered. Enzymatic and microbial heterogeneous catalyses will also be described. Studies of some important industrial reactions will be made. 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

CE8501 Polymer Science
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

CE8502 Polymerization Reaction Engineering
Introduction to polymerization. Chain growth polymerization. Kinetic model of radical polymerization, gel effect, molecular weight distribution. Stereoregulation of polymerization by Ziegler-Natta catalysis. Kinetic models. Principles of polymer reactor modeling: Batch, semi-batch and continuous reactors. Population balance equation for molecular weight. Introduction to control of polymerization reactors. 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

CE8602 Industrial Biotechnology
A lecture and assignment course on the chemical, physical and biological aspect of industrial processes; the newly-emerging DNA-based methods for the identification and classification of bacteria of environmental, medical, food and agricultural importance. Introduction to regulatory guidelines, licensing and safety issues for the biotechnology industry. Assignments include problem-solving, proposal and report writing, and oral presentations. 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

CE8605 Nanobiotechnology
This course introduces the fundamental concepts of nanobiotechnology and the up-to-date application of nanotechnology in life science. It has the objective of investigating emerging frontiers in achieving the goals of biotechnology through the use of nanotechnology as well. It also integrates materials science, chemical engineering, physics and life science toward the biological and biochemical applications. In this course, nanofabrication and the interaction between nanostructured materials and biological system at the nano-scale are all investigated thoroughly. Mainly, it teaches how to design and develop nano-devices that have application in the biomedical field targeting the improvement of healthcare industry. 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. Topics to be discussed include: 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. Case studies of specific tissue engineering applications will also be discussed. Students will be required to participate in as well as lead discussions on the course material as well as relevant journal articles. 1 Credit

CE8702 Design Operat.of Sm.Water Treat. Plants
Small water treatment plants (less than 20,000 PE) for industrial and domestic effluents play a central role in the overall water treatment policies of both developed and developing countries. The characteristics of these plants differ from those of large urban plants. Biofilm technologies like Rotating Biological Contractors, and Three-phase Fluidized Beds as well as Extended Aeration will

be discussed from the point of view of design and operation. Other separation and disinfection technologies will be presented in conjunction with the treatment units. 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

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

CE8803 Advanced Food Process Engineering
Modeling of food properties. Momentum, heat and mass transfer applied to the control of moisture, microbial population, and nutritive/organoleptic properties of foods during processing operations. Optimization and scale up design. Quality systems design. 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

CHILD AND YOUTH CARE

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
Major Research Paper (MRP)		(Milestone)
CY8000	Child and Youth Care Placement	Pass/Fail
CY8001	Child and Youth Care Theory	1
CY8002	CYC Research Methods	1
CY8003	CYC Advanced Clinical Practice	1
CY8004	CYC Management and Policy Dev	1
Two Elective credits		2

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
CS8924	Inclusion: Issues in Assessment	1
CS8926	Risk and Resilience	1
CS8938	Cross-Cultural Development	1
CY8009	Children's Rights in Practice	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 Placement
All students are required to complete a six-week, full time field placement (216 hours). Placements with an advanced practice focus will be limited to accredited or regulated service settings within Children's Mental Health, Child Welfare, Education, Hospitals or Community. Placements with a research focus will be at large agencies with quality assurance departments, or professional groups with research functions (such as OARTY, OACAS, Centre for Excellence in Children's Mental Health). Placements with either a management or a policy focus will be at regional MCYS offices, or with executive leadership at major agencies in the child and youth serving sectors. On a case-by-case basis, international or out of province placements will also be considered. 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. 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 Advanced Clinical 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

CIVIL ENGINEERING

CURRICULUM

Master of Applied Science

DEGREE REQUIREMENTS		Credits
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
Master's Project*	(Milestone)
Eight Elective credits (One may be a Directed Studies couse)	8

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

Doctor of Philosophy

DEGREE REQUIREMENTS		Credits
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
CV8200	Proc for Wtr Pollution Control	1
CV8201	Surface Wtr Quality Modelling	1
CV8202	Surface Wtr Pollution Analysis	1
CV8204	Soil Remediation	1
CV8205	Spec Topics: Env Engineering	1
CV8206	Water Resource System Analysis	1
CV8207	Waste Management	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
CV8310	Adv Foundation Design	1
CV8311	Risk and Reliability for Eng	1
CV8312	Steel-Skinned Comp Struct Sys	1
CV8313	Prestressed Concrete	1
CV8314	Anal Des & Cons of Tall Buildg	1
CV8315	Mechanized Tunnelling in Urban Areas	1

CV8400	Road Safety	1
CV8401	Traffic Operations and Mgmt	1
CV8403	Transportation Planning	1
CV8405	Pavement Design and Mgmt	1
CV8406	Adv Highway Geometric Design	1
CV8407	Special Topics: Transportation	1
CV8409	Urban Transport Systems	1
CV8500	Advanced Satellite Positioning	1
CV8501	Adv Geospatial Info Systems	1
CV8502	Digital Stereo Image Processing	1
CV8503	Geospatial Model and Visualiz	1
CV8504	Adv 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

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

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 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 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
The objective of this course is to provide graduate students with advanced management methodologies and decision-making tools that are essential for successfully managing complex construction projects. Analytical and quantitative approaches to complicated management issues in uncertain project environment are emphasized in this course. Topics covered in this course include project

scheduling with time, resource and budget constraints using operations research approaches, analytic hierarchy process for multi-criteria decisions, decision making under uncertainty, game theory, Monte Carlo simulation, project risk management, and life-cycle infrastructure management. 1 Credit

CV8105 Construction Administration and Management
This course offers topics that focus on skills and techniques useful in administering and managing within a project environment of the construction industry. Participants should, preferably, have some previous responsibilities in one or more phases of the development of major constructed facilities, either in the planning, design, or construction of the facilities. Topics offered include 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 issue of construction safety. 1 Credit

CV8106 Advances in Concrete Materials
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.

CV8200 Processes for Water Pollution Control
This course expands on the principles and designs involved in the handling and treatment of different water pollution control systems: municipal, stormwater, and combined sewer overflows. Topics cover physical, chemical, and biological treatment processes, as well as the more advanced and innovative treatment including carbon columns for dissolved organics removal, biochemical phosphorus removal, biological nitrification-denitrification, ammonia stripping, alternative disinfection methods, and detoxification of sludge. A theoretical approach, supplemented by practical design applications and problem solving, will be adopted. Antirequisite ES8902. 1 Credit

CV8201 Surface Water Quality Modelling
This course provides the fundamental concepts for modeling the physio-chemical and biological processes that pollutants undergo when discharged into different types of water bodies. Major topics include mass-balance and hydrodynamic equations in rivers, estuaries, harbours and lakes; finite-difference and finite element solution approaches; steady-state and time-variable pollutant discharges, principal water quality problems; dissolved oxygen eutrophication, toxic substances, indicator bacteria and viruses. Bioaccumulation of chemicals in aquatic animals and fishes through the food-chain and water vectors. 1 Credit

CV8202 Surface Water Pollution Analysis
A quantitative analysis of surface water pollution pathways is crucial to the development of water pollution prevention and control plans. This course will discuss the point and non-point sources in urbanized areas with emphasis on modeling approaches and analysis techniques. 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. 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

CV8206 Water Resources System Analysis
This course deals with the planning, design and management of multi-component water resources systems. After a review of the use and nature of water resources systems, topics studied in detail are: water resource economics, methodology of design, system analysis, system design and decision making, applied mathematical programming, probabilistic models and water quality sub-systems. Antirequisite: CVL903. 1 Credit

CV8207 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. Antirequisite ES8904. 1 Credit

CV8300 Solid Mechanics
Stress: notation; 2D and 3D transformation; differential equations of equilibrium; principal stresses; invariates. Strain: strain displacement equations; 2D transformation; relative displacement and notations. Isotropic stress strain formulations for plane stress, plain strain and 3D. Polar coordinates: governing equations and solutions. Tensor fundamentals; index notation; vector transformation of components; Kronecker; permutation symbols; tensor algebra; Gauss theorem. Equations of elasticity in tensor notation. Energy theorems. 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. Earthquake response of linear systems. Earthquake response to inelastic systems. Structural dynamics in International Building Codes. 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, relevant properties of HPC, materials and mechanical properties, producing and curing HPC, shrinkage problems, temperature effects, design issues, 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

CV8310 Advanced Foundation Design
This course considers practical design of advanced shallow and deep foundations for various structures. The topics cover review of soil mechanics, subsurface investigation, foundation type, design principles, shallow foundation, pile design for axial and lateral loads, pile group design, shaft design, micropile design, and numerical simulation of foundations using software. 1 Credit

CV8311 Risk and Reliability for Eng
The main purpose of this course is to present a comprehansive 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 project risk management. 1 Credit

CV8312 Steel-Skinned Comp Struct Sys
The aim of this course is to equip students with advanced knowledge of multi-disciplinary aspects of modeling, analysis, design and construction of steel-skinned composite structural systems. 1 Credit

CV8313 Prestressed Concrete
The primary objective of this course is to explain the basic concepts necessary to understand and predict the response of prestressed concrete members and to design prestressed concrete structures. Basic concept of prestressing including pretensioning and post-tensioning technology will be reviewed. A comprehensive summary of the material properties of concrete and prestressing steel is given. The course provides a basic understanding of prestressed concrete behaviour including design procedure for members subjected to flexure and shear and estimating relevant deflection of prestressed concrete beams. 1 Credit

CV8314 Anal Des and Cons of Tall Buildg
Overview of design philosophy and structural forms/systems for tall buildings; loadings and Code based analyses; lateral load resisting systems, structural modeling and analysis of various tall building systems; structural design of tall buildings and case studies; other tall building aspects such as stability, fire safety, dynamic response, human response to building motions, foundation systems, construction/base isolation techniques, wind tunnel studies, research/developments and sustainability issues. 1 Credit

CV8315 Mechanizedd Tunnelling in Urban Areas
This course considers plan, design, and construction control of mechanized tunnelling in urban environments. The topics covers tunnelling in urban environments and related challenges, risk management and mitigation, tunnel alignment selection, TBM types and selections, support systems and design methods, settlement prediction and control, tunnel construction control, station support design, case histories, and numerical simulation of tunnelling using software. 1 Credit

CV8400 Road Safety
This course provides an understanding of the safety management process and the variety of tools used. Topics include: probability models of accident occurrence; estimation of safety in developing and evaluating countermeasures; methods for identifying hazardous elements; safety of road facilities: intersections, roadways, roadsides, railroad crossings and traffic control elements; driver, pedestrian and bicycle safety; applications of human factors principles; safety audits; vehicle safety; biomechanics of injuries; multidisciplinary accident investigation. 1 Credit

CV8401 Traffic Operations and Management
The course introduces topics related to the management of congestion on urban road networks. These include: capacity analysis; deterministic and stochastic models of traffic behaviour; traffic assignment models; incident detection and management; ramp metering; signal timing for networks and arterials; Applications of Intelligent Transportation Systems; demand management. Antirequisite: CVL902. 1 Credit

CV8403 Transportation Planning
This course deals with the process and techniques of transportation planning, with emphasis on urban and regional applications. Topics include: historical development of transportation planning in North America; transportation planning framework; surveys and data collection; transportation-land use interaction; analysis and models of transportation demand; analysis and models of transportation performance; development and evaluation of transportation planning options. Antirequisite: CVL910. 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. Unconventional topics such as intelligent transportation systems and roundabouts 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
This course provides graduate students with optimization and simulation methods to solve logistics problems faced by decision-makers for urban infrastructure, including public transport systems, last-mile freight operations, traffic dynamics, and emergency response. The course emphasizes methods to evaluate strategies in an urban setting complicated by dense populations, high uncertainty, and ubiquitous data. Applications include transit network design, facility location problems, congestion pricing, and humanitarian logistics. Basic knowledge of transportation engineering and optimization is expected. 1 Credit

CV8500 Advanced Satellite Positioning
Overview of satellite positioning methods; description of GPS satellite orbits; characteristics of the GPS signals; GPS signal propagation; GPS measurements errors; GPS observables; linear combination of GPS observables; GPS models for short, medium and long distances; integer ambiguity determination for one, two and three frequencies; integration of GPS and GLONASS; integration of GPS and INS; 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 of sensors for high precision 3D data extraction; calibration and modeling of digital imaging systems; inclusion of various geometric constraints; solution approaches for convergent imaging geometries from multi-sensor networks; automation aspects of image correlation and feature extraction; image rectification procedures; applications in the areas of engineering deformation; industrial Photogrammetry; reverse engineering and medical imaging. 1 Credit

CV8503 Geospatial Modeling & Visualization
This course will examine current research topics in applications of remote sensing imagery for generating and visualizing environmental models. The focus is on integration of multisource and multiscale geospatial data at a local and regional scale for dynamic and multidimensional modeling and visualization tasks in a stand-alone or web-based environment. Selected case studies in transportation, forestry, agriculture, and urban landscape are addressed. 1 Credit

CV8504 Adv Estimation and Data Series Analysis
Least squares estimation, batch and sequential estimation methods, constraints. Kalman filtering. Concept and classification of random processes, auto- and cross-correlation functions, spectral density function, discrete Fourier transform and fast Fourier transform, digital filters. 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. Antirequisite: CVL736. 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
This course examines the characteristics of high-resolution space-borne remote sensing systems and their applications for the mapping and analysis of complex urban scenes. Major topics include overview of high-resolution satellite remote sensors, multi-sensor data fusion, knowledge-based image analysis, photogrammetric processing of satellite images for 3D object extraction, intelligent change detection systems, and integration of remote sensing and 3D urban GIS. Selected case studies in urban transportation planning, land-use/land-cover mapping, human settlement management and environmental impact analysis are addressed. 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

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		5
	(at least one from each of the groups)	
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**
CC8210	Genders, Sexualities and Screens	1
CC8819	Cultures of Museums, Archives	1
CC8822	Performing Arts and the City	1
CC8823	Transnat Id, New Mediations	1
CC8824	Globlzn: Mkts, Citizen, Identity	1
CC8825	Seminar Social Cultural Theory	1
CC8826	Post-Human Cndn: Theory, Polit	1
CC8827	City as Cinema	1
CC8828	Philosophy, Culture and Values	1
CC8829	Modernist Lit Circ: Cult'l Appr	1
CC8830	Writing the Self, Reading the Life	1
CC8831	Theorizing the Sacred	1
CC8833	Cultures of Sexuality, Gender	1
CC8834	Images of Animals	1
CC8835	Global Cultural Flows After 9/11	1
CC8836	Topics in Media and Culture	1
CC8837	Asian Studies 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
CC8923	Culture as Perf: Anthr of Arts	1
CC8924	Marxism Culture and Film	1
CC8925	Reading Television	1
CC8926	Theoretical Issues in Film	1
CC8927	Reading Film	1
CC8928	Culture and the Environment	1
CC8929	Seminar: Symbolic Anthropology	1
CC8930	Cult & Values - Pop Media	1
CC8931	Popular Music Studies	1
CC8932	Commun Culture and the City	1
CC8933	Culture in the City Workshop	1
CC8934	Contemp Topics: Social Theory	1
CC8935	Critique of Everyday Culture	1
CC8936	Cultural Condit of Authorship	1
CC8938	Spec Top in Media Culture B	1
CC8939	Special Topics in Media Culture A	1
CC8020	Social Theory and Comm Process	2
CC8021	Film and Social Change	2
CC8022	Mediations of Identity	2
CC8023	Contmp Topics: Social Theory	2
CC8024	The Critique of Everyday Culture	2
CC8025	Summer Seminar in Social, Cultural Theory	2
CC9920	Topics in Psychoanl and Culture**	1

**doctoral level only

Group II: Specialization Electives in Politics and Policy		**Credits**
CC8702	Labour in Comm and Culture	1
CC8840	Media Democracy	1
CC8841	Owning Culture	1
CC8842	Public Affairs Media	1
CC8843	Culture Cntrpublic and The WTO	1
CC8844	Intro to Broadcast Management	1
CC8845	Commun and International Devel	1
CC8846	Communication and Public Interest	1
CC8847	Global Media	1
CC8848	Armed Conflict, Peace & 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
CC8942	Cross-Cult & Internat Commun	1
CC8943	Globalization of Comm & Cult	1
CC8944	Technology and Globalization	1
CC8946	Communication Policy	1
CC8947	Cultural Policy	1
CC8948	The Image Industry	1
CC8949	The Communications Industry	1
CC8950	Current Issues: Telecommun	1
CC8951	Communications Law	1

CC8952	Political Economy of Media	1
CC8953	Politics of Intellec Property	1
CC8954	New Social Movements	1
CC8956	Globlzn & Cultural Identity	1
CC8958	Readings in Public Policy	1
CC8959	Spec Topics: Politics & Policy	1
CC8051	Readings in Public Policy	2

Group III: Specialization Electives in Technology in Practice		**Credits**
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	1
CC8960	Adv Communication Technology	1
CC8961	Issues in Media Production	1
CC8962	Lang & Narrative Film/Video/Mm	1
CC8963	Social Cult Impl of New Media	1
CC8964	Diffusion of Commun Technol	1
CC8965	Communication in Organizations	1
CC8966	Activist Video Making	1
CC8967	Contemp Theory in Visual Arts	1
CC8968	History & Theory of Film & Video	1
CC8969	Media Ethics	1
CC8970	Special Topics in Cdn Cinema	1
CC8971	Experimental Media	1
CC8972	Experimental Film Processes	1
CC8973	Design: Interactive Multimedia	1
CC8974	Cultural Production Workshop	1
CC8975	Race & Gender in Digital Tech	1
CC8976	Digital & Interact Entertainmt	1
CC8977	Media Prod Techniques & Pract	1
CC8978	Documentary Narration	1
CC8979	Spec Topics:Technology & Commun	1
CC8980	Adv Media Production Project	1
CC8981	Internet Creativity & Innov	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 I	1
CC8987	Selected Topics, Tech in Pract	1
CC8988	Design and Research Theory	1
CC8989	Design Issues	1
CC8060	Cultural Production Workshop	2
CC8061	Wired World: Cult Tech Phil	2
CC9921	Technology Commun & Culture*	1
CC9922	Cinema and Media 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
CC8090	Directed Rdg: Commun & Culture	2
CC8091	Directed Rsrch: Comm & Culture	2
CC8092	Directed Grp St: Comm & Cult	2
CC8093	Field Placements	2

The following courses may be used by Doctoral candidates in place of any Specialization course, with the permission of the Program Director.		**Credits**
CC9990	Directed Readings A	1
CC9991	Directed Readings B	1
CC9992	Directed Research	1
CC9993	Directed Group Study	1
CC9090	Directed Readings A	2
CC9091	Directed Readings B	2
CC9092	Directed Research	2
CC9093	Directed Grp Stud Comm & Cult	2

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

CC8020 (CMCT 6103 6.0) Social Theory and Communication Processes
Theories of communication processes, the mass media, and symbolic behaviour. The mass media and the controversies about popular culture; criteria for evaluating the media; research methodology; and content analysis. Antirequisite SPT 6032 6.0 (York University), SOCI 6560 6.0 (York University). 2 Credits

CC8021 (CMCT 5102 6.0) Film and Social Change
This course investigates the ways in which films of all kinds can be used as a means to radical insights into culture, giving consideration to the contributions to film criticism and theory offered by various radical movements such as Marxism, Feminism, and Gay Liberation. Antirequisite FILM 4410 6.0 (Atkinson). 2 Credits

CC8022 (CMCT 5103 6.0) Mediations of Identity
This course is premised upon the principle that the mass media undertake the function of moral, political and ideological reproduction within society. In this respect, the course examines the ways in which media's representations of social identity (e.g. race, sexuality, gender, class, nation), act as highly selective and ideologically shaped portrayals of the social order. We shall closely consider current and 'classical' theories which allow particular insight into social construction of human identities, subjects and subjectivities. These theoretical frames of reference will also be applied in the analysis of various media forms and genres (including photography, television and film). Antirequisite AS/SOSC 4325 6.0 (York University). 2 Credits

CC8023 (CMCT6113 6.0) 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 6.0 (York University), PHIL 6640 6.0 (York University). 2 Credits

CC8024 (CMCT6121 6.0) 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 6.0 (York University) & SPT 6609 6.0 (York University). 2 Credits

CC8025 (CMCT 6130 6.0) Summer Seminar in Social, Cultural Theory
This seminar examines key aspects of contemporary social and cultural theory, focusing on the writings of an important theorist in the field. Normally, that theorist will participate in the course for one week, offering a series of seminars on her/his work. 2 Credits

CC8051 (CMCT6313 6.0) Readings in Public Policy
Exploration of key ideas about public policy processes with an emphasis on how this process is played out in the various policy areas of interest to students in the course. Antirequisite ENVS 6101R 3.0 (York University). 2 Credits

CC8060 (CMCT6510 6.0) Cultural Production Workshop
Combines active media analysis with the production of images/text around environmental issues. Students critically explore the production process through media observations, readings, and audio-visuals, visits to production sites, and interviews with image-makers. There are opportunities to develop hands-on skills in photographic or video production. The central learning experience of the workshop involves a media production applying analytical insight, technical skills, and creativity. Antirequisite ENVS 6349 6.0 (York University). 2 Credits

CC8061 (CMCT6520 6.0) Wired World: Culture, Tech. & contemp. Phil.
This course explores the intersection of philosophical thought with communication and information technology. It considers both the importance of philosophical foundations for contemporary studies of technology as well as the philosophical implications of advances in contemporary communication technology. 2 Credits

CC8090 (CMCT 6911 6.0) Directed Readings in Commun. and Culture
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. 2 Credits

CC8091 (CMCT 6902 6.0) 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 project. 2 Credits

CC8092 (CMCT 6903 6.0) 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. 2 Credits

CC8093 (CMCT 6909 6.0) Field Placements
Master's students are able to receive credit for a two term course by undertaking a field placement in an appropriate institution.
2 Credits

CC8210 Genders, Sexualities and Screens
An interdisciplinary and cross-cultural interrogation of gender and sexuality in relation to a variety of media forms including film and television, cable, gaming and the Internet. We will take into account theories of popular culture, post-structuralism, feminist theory, visual culture, queer subjectivities and the body, as they impact upon media content, audiences, and sites of reception. Antirequisite: MP 8112 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)

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. Antirequisites EDUC 5856, ARTH5185 (York University)

CC8819 (CMCT 65xx 3.0) Cultures of Museums and Archives
This course examines the cultures of museums and archives. Focusing on their history and contemporary practice, course investigates conditions under which institutions make explicit and conceal their political and educational mandates while further exploring their status as sites of resistance and cultural production. Also, consideration is given to museum's role in tourist industry and by extension, extent to which memory, trauma and history are commodified through museum and its commercial arms (e.g., museum gift shop). 1 Credit

CC8822 (CMCT 6112 3.0) Performing Arts and the City
This course examines the impact of the performing arts on local communities. 1 Credit

CC8823 (CMCT 6116 3.0) Transnat. Id., New Mediations & the Public
This course explores the ways in which communications technologies shape national identities and understandings of public goods. We consider transformations and contestations of the public sphere, the public domain, intellectual property, freedom of speech, and multiculturalism in the face of an intensification of global population and cultural flows. 1 Credit

CC8824 (CMCT 6108 3.0) Globalization: Mkts, Citizenship, Identity
This course examines the discourse and theory of globalization narratives, pre-and post-Seattle from a critical perspective as they affect markets, cultural policy, public goods and diverse citizenship needs. 1 Credit

CC8825 (CMCT 6130 3.0) Summer Seminar in Social, Cultural Theory
This seminar examines key aspects of contemporary social and cultural theory, focusing on the writings of an important theorist in the field. Normally, that theorist will participate in the course for one week, offering a series of seminars on her/his work. 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

CC8827 (CMCT6124 3.0) City as Cinema: Film and City Spaces
This course seeks to locate dialectic in the relation between the cinema and the city to discern how particular experiences of city space and temporality have been expressed in the non-linear narratives or decentred spaces of some recent films or in the very design of cinema screens and theatres. 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 6109B 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.

CC8830 (CMCT 6128 3.0) Writing the Self, Reading the Life
This course will examine a variety of genres within the broadly defined category of life writing, including diary, memoir, autobiography, and biography. By sampling a range of texts from print, graphic, and electronic sources, students will explore the diverse ways in which people, both famous and otherwise, have communicated their personal and public stories about life and selfhood throughout history. 1 Credit

CC8831 (CMCT 6125 3.0) Theorizing the Sacred
Some of the most important social theorists of the 20th Century - including Georges Bataille, Walter Benjamin, René **Girard,** Jacques Derrida, and Slavoj Zizek - have written on the sacred and its related phenomena (the gift, originary violence, monsters, etc). The sacred is not limited to religion, but also represents the underbelly of cultural and political life more generally. In analysing the sacred, special focus will be placed on both the role and content of cinema. 1 Credit

CC8832 (CMCT 6534) 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. 1 Credit

CC8835 (CMCT6323 3.0) Global Cultural Flows After 9/11
This course will explore the way contemporary print and electronic media analysis is reshaping citizenship practice and state policy globally and locally. One of the aims of the course is to examine the contradictory effects that global cultural flows have on ideas, media coverage, and new citizenship practices. It will also examine the ways ideoscapes are being redefined by the mass media by using thematic case studies to illuminate the extent to which the processes of globalization and new information technologies are altering the role of culture and communication in both the global North and South. 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 speciality 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 Media and Culture. 1 Credit

CC8837 (CMCT 6136 3.0) Asian Studies Perspectives
The course examines how Asian spaces and identities have been produced historically drawing on perspectives from across the social sciences and humanities; and the current relevance of area studies in an era in which international scholarship is oriented toward globalisms and localisms. Antirequisites: HUMA 6135, GEOG 5700, ANTH 5500 or SOCI 6745 3.0 (York University) 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 6540 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
The course explores the ways in which law shapes popular culture, with emphasis upon the intellectual property regimes of copyright, publicity rights, trademark, and domain names. We consider how these laws create rights to control meaning and effect forms of censorship, while provoking the emergence of alternative community norms. 1 Credit

CC8842 (CMCT 6316 3.0) Public Affairs Media
This course examines public affairs radio, television and convergence media from an historical and critical perspective. These media are examined with reference to models of broadcasting, public address, technology and globalization. 1 Credit

CC8843 (CMCT 6317 3.0) Cultural Industries, Trade and the WTO
This course examines the impact of trade and the WTO framework in shaping the culture and communications policy environment for governments and communities. It is designed as a research seminar to enable students to examine the way the WTO is shaping and influencing cultural and communications policy. 1 Credit

CC8844 (CMCT 6340 3.0) Introduction to Broadcast Management
Television is the most powerful form of public communication and, in Canada, is a highly regulated business. Those who manage television enterprises must balance business objectives and the public good in a changing creative and technological environment. This course examines issues in the management of public and private television enterprises in Canada. Students will investigate each issue in its historical context and will analyze the current environment and scenarios for the future of Canadian broadcasting. The course will include field visits and industry guests. 1 Credit

CC8845 (CMCT 6321 3.0) Communication & International Development
This course brings together various theoretical and policy approaches to communication and international development. As a seminar, selected critical readings will serve as a backdrop for discussions on the nexus of communication, technology, development and the nation-state. We will interrogate the historical and social construction of development and underdevelopment, and how state actors mobilize the rhetoric of technology to galvanize support for the national development. 1 Credit

CC8846 (CMCT 6315 3.0) Communication and Public Interest
This course explores the meaning of "public" in the context of media and public information/advocacy campaigns. A background in communication theory is recommended but not required. 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
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 speciality 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. Antirequisite: POLS 6087 3.0 (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
This course examines a wide range of issues and periods in North American and Western European media history between 1500 and 1980, combining approaches from cultural studies, political economy and archivally-based historical research. It focuses on emergence and evolution of new media forms and technologies in the past, including news media, the telegraph and global information networks, the first mass-audience media, and radio and television (both cultural and institutional perspectives). Antirequisite: HIST 5730 (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 "pictoral 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.

CC8923 (CMCT 6102 3.0) Culture as Performance-Anth. of the Arts
This course explores expressive culture by examining the performance and products which express cultural meaning. It investigates how performances are produced, interpreted and transformed through time, utilizing theoretical arguments related to the process of cultural production, including structuralism, formal analysis, semiotics and hermeneutics. Key questions include: how are artistic domains integrated within a society? What regularities and patterns can be seen cross-culturally within one form of artistic expression? How do artistic forms condense and communicate key symbolic messages? How is artistic expression transformed through mass culture and tourism? 1 Credit

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 POLS 6055 (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

CC8926 (CMCT 5101 3.0) Theoretical Issues in Film
This course examines screen representation from a historical, sociological, and critical perspective, introducing relevant contemporary theoretical approaches framed as analysis of a particular theme, period, filmmaker, or genre. Attention is given to a range of problems including filmic representation and indexicality; dramaturgy; the history of filmic representation and its political economy; filmic representation and hegemony. Antirequisite FILM 5210 3.0 (York University). 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

CC8928 (CMCT 6120 3.0) Culture and the Environment
Critical exploration into current literature in the emerging field of Cultural Studies. Examination of the discourses through which we attach "culture" to nature, place, and space. Particular attention is given to what resources contemporary cultural studies might offer in analyzing interactions between culture, nature, and place; between social identity, community, and built and natural environments. 1 Credit

CC8929 (CMCT 5104 3.0) Seminar in Symbolic Anthropology
Particular attention is placed on a fundamental understanding of symbolic thought and action with the aim of addressing the questions: how do symbols symbolize? How do they function to mediate meanings and transform sentiment and emotions into significant inducements or dispositions to action? Literature in anthropology, language and linguistics, semiotics and literary criticism among others are surveyed. Antirequisite ANTH 5140 3.0 (York University). 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 examine a variety of conceptions of culture in use in the social sciences, humanities and fine arts in particular with relevance to how they can be used to inquire into social forms and practices of city life. The course will further seek to perpetuate an ongoing intellectual relationship to the reciprocal exchanges between interpretation of culture and of the city and bring this discussion to bear on representations of space, urbanity, communication, congestion and memory. Readings will include Durkheim, Weber, Simmel, Park, Bakhtin, Benjamin, Harvey, Seja, and Sassen. . Antirequisites SOCI 6132 3.0 (York University), SPT 6626 3.0 (York University). 1 Credit

CC8933 (CMCT 6115 3.0) Culture in the City Workshop
This course will be conducted as a research workshop in which students will be encouraged to initiate, design, and develop an exploratory study on a specific social process in the city, and create a framework for treating spaces and localities as interpretive problems through qualitative methods. The workshop will provide experience and skill in case study analysis and ethnographic and documentary methods for interpreting texts, sites and social actions. The instructor will aid students in identifying problems related to select areas of urban life and in generating a small study as a course requirement. Students will be expected to contribute to the collegiality of the environment by discussing their mutual work as part of a process of developing theoretically informed case studies. Antirequisite SOCI 6132 3.0 (York University), SPT 6626 3.0 (York University). 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. Antirequisites 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. Antirequisites SOCI 6130 3.0 (York University), SPT 6609 3.0 (York University) 1 Credit

CC8936 (CMCT 6107 3.0) The Cultural Conditions of Authorship
With its focus on the author and the cultural conditions of authorship, this course aims to fill a gap in current course offerings in the Media and Culture stream of Program. The author and the book are all but absent from a program that studies the dynamics of media and cultural production. This course returns to the subject of the book as one of the earliest and most enduring examples of cultural production. By focusing on the economy of the culture industry – specifically the social, political, historical, and material conditions of authorship – this course undertakes a study of the commodification of Canadian authors that began in the early nineteenth century and continues to this day.
1 Credit

CC8938 (CMCT 6109B 3.0) Special Topics in Media and Culture B
Under this rubric, program faculty members propose limited duration courses arising from major research projects or current issues.
1 Credit

CC8939 (CMCT 6109A 3.0) Special Topics in Media and Culture A
Under this rubric, program faculty members propose limited duration courses arising from major research projects or current issues.
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

CC8942 (CMCT 6302 3.0) Cross-Cultural and International Commun.
This course examines communication in the context of divergent cultural value systems, differing levels of technological adaptation, and unequal power configurations. It explores applications in international development, business communication, and cross-cultural electronic communication. 1 Credit

CC8943 (CMCT 6303 3.0) Globalization of Communication & Culture
This course focuses on the role and significance of the rapid growth of multinational communication industries in shaping the modern world, with particular emphasis on the relationship between technology and the structures of power and control. Global communication systems, the global economy, and global crises will be examined from a critical perspective. 1 Credit
Note: This course will focus on the needs of PhD students. MA students with appropriate background will be admitted with permission.

CC8944 (CMCT 5301 3.0) Technology and Globalization
This course examines the role of technology within the global context. What will it mean to be part of a global audience, work in a global factory, shop in a global supermarket, be governed by a world government? Can technology help to solve problems of environmental depletion and pollution? What role does technology play in escalating militarism around the world? Can technology reduce the gap between rich and poor, within nations and between nations? Antirequisite: POL607. 1 Credit

CC8946 (CMCT 6305 3.0) Communication Policy
This course will examine the structure and functioning of the media industries and explore the government policies that have been developed to try to ensure that the media function effectively and in the public interest. While emphasis will be placed on the communication media in Canada, attention will also be given to the way in which the media function in other countries and on an international basis. In examining Canadian government policy, attention will be given to public policies in other countries. The mandate and operation of agencies such as the CRTC, the CBC, the National Film Board, and Telefilm Canada will be examined, as well as the central policy development mandate of the federal Department of Canadian Heritage (Previously the Department of Communications). The course will include an examination of a number of major federal policy documents. Attention will be given to special issues arising from the bilingual nature and regional character of Canadian society and to the respective roles of federal and provincial governments. While the primary emphasis is on established media, the course will include consideration of issues related to new media, including discussion of the Information Highway Advisory Council's Phase I and II reports. Antirequisite ARTM 6330 3.0 (York University). 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

CC8948 (CMCT 5302 3.0) The Image Industry
Images are organized into presentations and exhibitions in books and periodicals, in cinemas, in concerts, plays, and performances, at conferences and conventions, in galleries, in lectures and readings on television and closed circuit systems, in recordings, and theatres. This course examines the nature and operations of the image industry, its relationship with image users and consumers and its interaction with individual image makers. Antirequisite NPF 552. 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

CC8951 (CMCT 6307 3.0) Communications Law
Communication law and regulation are viewed from two perspectives: first, the rationales for regulating broadcasting and telecommunications are explored; and secondly, areas of law and regulation in the fields of broadcasting and telecommunications are examined, including cultural regulation, standards, access, quality service, new services, and rates. This course will examine law, policy, and regulations concerning broadcasting (radio, TV and news services) and telecommunications. Of particular interest are questions about controversial and biased programming, access to media, Canadian content, and the implications of competition and new services in the Canadian broadcasting system. In telecommunications, emphasis will be given to issues arising from competition and new technologies. Antirequisite Law 3005 3.0 (Osgoode). 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

CC8956 (CMCT 6311 3.0) Globalization and Cultural Identities
This course explores globalization and its influence on the construction of cultural identities. We address the contested term and its impact on nations, institutions, and peoples as they experience in local situations special and temporal transformations produced in discourses, images, and actions resulting from this process. Antirequisite SPTH 6212 3.0 (York University) and ANTH 5135 3.0 (York University). 1 Credit

CC8958 (CMCT 6313 3.0) Readings in Public Policy
Exploration of key ideas about public policy processes with an emphasis on how this process is played out in the various policy areas of interest to students in the course. Antirequisite ENVS 6101R 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

CC8961 (CMCT 6501 3.0) Issues in Media Production
Contemporary theory is employed to examine the changes in socio-technical systems and the production environment as well as the craft. Group projects may include radio news and drama, broadcast and print journalism, documentation for studio television, as well as CD-ROM, visualization, and web-based projects. 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

CC8964 (CMCT 6505 3.0) The Diffusion of Commun. Technologies
Technology is often adopted in ways not anticipated by its creators and is shaped by the interaction of technological innovation, economic interests, and social and political power. This course explores the models developed for understanding the diffusion of communication technologies in society and examines specific cases, such as the printing press, the motion picture, the telephone, television, the computer, and the Internet. 1 Credit

CC8965 (CMCT 6506 3.0) Communication in Organizations
This course presents a framework for understanding communication in organizations, including contingency, structuration, and interpretive approaches. The course exposes students to a variety of perspectives on telecommunication. It considers technological, social, cultural and economic perspectives at the organizational level and their implications. 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

CC8968 (CMCT 5502 3.0) History and Theory of Film and Video
This course enables students to concentrate on specific aspects of the history and theory of film and video. The course deals with national and alternative cinema, film genres and alternative video. The relationship between the aesthetic features of given works and their cultural production are emphasized. Antirequisite NPF 557. 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

CC8970 (CMCT 5504 3.0) Special Topics in Canadian Cinema
A seminar course focusing on particular topics in Canadian film and video. Antirequisite FILM 5310 3.0 (York University). 1 Credit

CC8971 (CMCT 5505 3.0) Experimental Media
In the past century, groups of artists have repeatedly called for new methods for the creation of artworks, to revitalize arts that had grown dreary, stale, and predictable. The course comprises workshops and seminars and explores the value of such proposals. Antirequisite NPF555. 1 Credit

CC8972 (CMCT 5506 3.0) Experimental Film Processes
An exploration of alternatives to conventional ways of producing black and white and colour cinematographic images, including non-standard ways of generating cinematographic images and unorthodox means of transforming them. Antirequisite FNP 544.
1 Credit

NOTE: Students with appropriate background may take selected production courses in various units for graduate credit, with permission. A list of Ryerson and York courses available for this purpose will be made available prior to registration in September.

CC8973 (CMCT 6502 3.0) Design for Interactive Multimedia
This course examines multimedia production in the context of a studio environment. Particular emphasis is placed on design models and their applications. 1 Credit

CC8974 (CMCT 6510 3.0) Cultural Production Workshop
Combines active media analysis with the production of images/text around environmental issues. Students critically explore the production process through media observations, readings, and audio-visuals, visits to production sites, and interviews with image-makers. There are opportunities to develop hands-on skills in photographic or video production. The central learning experience of the workshop involves a media production applying analytical insight, technical skills, and creativity. Antirequisite ENVS 6349 3.0 (York University). 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 digitisation of information to the social, economic, and political changes currently sweeping Canada, as well as the rest of the OECD. In this course, we will examine the ways in which race and gender manifest in the discourses, policy decisions and representations of digital technology in Canada.
1 Credit

CC8976 (CMCT 6512 3.0) Digital and Interactive Entertainment
This course examines the convergence of digital content, broadband and wireless distribution over a variety of display platforms. If compatibility standards and data-protection schemes are worked out, we will be able to enjoy, create and distribute content in a variety of new ways. 1 Credit

CC8977 (CMCT 6517 3.0) Media Production Techniques and Practices
This course introduces students to a wide range of media-making techniques and production processes, including those currently employed and emerging in various media industries. The course will include lab demonstrations, practical workshops and examination of the context and social implications of these techniques and processes. 1 Credit.

CC8978 (CMCT 6514 3.0) Documentary Narration
While non-fiction films are most frequently discussed in terms of the images they bring to us, most of these films from early sound newsreels to present day historical essays are in fact highly dependent upon the quality of their voice-over narration. This course will focus on the nature of the writing that has shaped those works, including its relationship to the images. The course will also examine the way in which voice-over narration is used in television news and television actuality programming as well as personal essays. Antirequisite: FILM 5320P 3.0 (York University). 1 Credit

CC8979 (CMCT 6509 3.0) Special 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

CC8980 (CMCT 6518 3.0) Advanced Media Production: Project
This course offers students who have advanced production skills and who have successfully completed the necessary technical proficiency examinations to access equipment and an opportunity to develop and produce their own media project. Students will work independently or in teams to produce a previously approved production using existing or emerging technologies from a variety of media. 1 Credit

CC8981 (CMCT 6513 3.0) Struggle for Internet Creativity & Innov.
This course is about the future of ideas. The Internet environment was originally designed to enable the new and is now being transformed to protect the old. The course examines principles and technologies needed to let innovation flourish on the Internet.
1 Credit

CC8982 (CMCT 6118 3.0) The Body and the Culture of Modernity
In the later half of the twentieth century, the body emerged as a topic that attracted the efforts of many artists who were committed to some form of cultural critique. Many recent artists have revolted against the modern body – the mechanized, regimented, controlled and profoundly unfree body. They have strived to move beyond the culture of modernity by creating a Dionysian body

culture that is life-affirming, a culture that expresses bodily energies and passions, a culture that will bind people together in shared cultural experiences of ecstasy and intoxication. They have strived to dissolve the individual ego in collective ecstasy and sensual surrender. In this course we will survey some themes that arise in recent body art and assess their political/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. 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 I
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. 1 Credit

CC8987 (CMCT 6535) 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 speciality 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

CC 8988 (CMCT 6524) Design and Research Theory
For the past 25 years the discipline of design has been developing its own theoretical and research base. This course examines both the range and findings of the design research that has been completed and reviews the theoretical groundwork for mapping out individual research strategies for the future. The course employs lectures, case studies, and exploration at both the individual and group levels. Antirequisite MDES 5101, York University. 1 Credit

CC8989 (CMCT 6525) Design Issues
This course examines contextual issues for communication design. Topics include technological innovation, social change, cultural values and behaviour, and business models. The course employs lectures, presentations and extensive readings. Antirequisite MDES 5102, 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

CC9090 (CMCT 7011 6.0) 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. 2 Credits

CC9091 (CMCT 7012 6.0) 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. 2 Credits

CC9092 (CMCT 7002 6.0) 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. 2 Credits

CC9093 (CMCT 7003 6.0) Directed Group Study in Commun. & Culture
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. 2 Credits

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

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.

CC9920 (CMCT 7120 3.0) Selected Topics in Psychoanalysis and Culture
This course will survey some of the key concepts of Freudian and post-Freudian theory and assess their value in the study of culture and society. The course will then present an overview of some of the ways that psychoanalytic theory has been used in the study of culture. 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. Doctoral Foundation Course. 1 Credit

CC9922 (CMCT 7125 3.0) Cinema and Media: Key Concepts
The course will explore key concepts, texts and debates in the field of contemporary cinema and media studies. A central focus of course will be on the intellectual and material histories of cinema studies and media studies as disciplines (and their recent convergence), including the development of different models of film study (film as art, culture, sociological force, industry, etc); the development of classical film theory and film criticism; semiotics and feminist film theory; the historical turn; and the mutual influence of other disciplines in relation to the study of cinema and media. Antirequisite: FILM 7000 3.0 (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

COMMUNICATION AND DESIGN COURSES

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.

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
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

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. Prerequisites 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 8813. 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 8810. 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 8810. 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 8816. 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 8810. 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

COMPUTER SCIENCE

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		Credits
Thesis Option		
Master's Thesis		(Milestone)
Master's Seminar		(Milestone)
4 Electives		4
Major Research Paper (MRP) Option		
Major Research Paper (MRP)		(Milestone)
Master's Seminar		(Milestone)
6 Electives		6
Course Only Option		
8 Electives		8
Electives		
CP8201	Algorithms and Computability	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
CP8207	Special Topics: Core Computer Sci	1
CP8210	Topics in Data Science	1
CP8215	Research Methods in Comp Sci	1
CP8301	Secure Computing	1
CP8302	Software Metrics	1
CP8303	Collaborative Computing	1
CP8304	Distributed Systems	1
CP8305	Knowledge Discovery	1
CP8306	Presence	1
CP8307	Introduction to Computer Vision	1
CP8308	Visualization	1
CP8309	Special Topics: Emerging Comp Sci	1
CP8310	Directed Studies in Computer Sci	1
CP8311	Genetic Programming	1
CP8314	Advanced Artificial Intelligence	1

Doctor of Philosophy

First Offered Fall 2011

DEGREE REQUIREMENTS		Credits
Doctoral Candidacy Examination		(Milestone)
Doctoral Dissertation		(Milestone)
CP8101	Research Methods: Doctoral	Pass/Fail
CP9101	Method of Instruction	1
CP9102	Doctoral Seminar	Pass/Fail
4 courses (minimum) – Two courses from each Field		4

Field I: Intelligence and Robotics		Credits
CP8206	Soft Computing and Machine Intel	1
CP8210	Topics in Data Science	1
CP8204	Advanced Programming Languages	1
CP8205	Adv Human-Computer Interaction	1
CP8303	Collaborative Computing	1
CP8305	Knowledge Discovery	1
CP8306	Presence Through Robotic Interaction	1
CP8307	Introduction to Computer Vision	1
CP8308	Visualization	1
CP8311	Genetic Programming	1
CP8312*	Directed Studies-Intelligence and Robotics	1
CP8314	Advanced Artificial Intelligence	1
CP8315	Special Doctoral Topics: AI & R	1

Field II: Networks		Credits
CP8201	Algorithms and Computability	1
CP8202	Advanced Software Engineering	1
CP8203	Advanced Database Systems	1
CP8301	Secure Computing	1
CP8302	Software Metrics	1
CP8304	Distributed Systems	1
CP8313	Directed Studies-Networks	1
CP8316	Special Doctoral Topics: Networks	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. 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".

Master's Seminar
The student is required to attend departmental seminars on current research in the specialization fields and emerging areas of computer science. Seminars will run through the Fall and Winter semesters. Presentations will be given by graduate students, faculty members, visiting scholars and guest speakers. Each student is required attend a minimum of ten publicly-announced seminars and to give one oral presentation on his/her research work. 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 for Doctoral Students
This course is designed to assist students in developing skills necessary to design and execute a research protocol for their terminal degree. The course is intended to complement the specific research programs devised by the student and his/her advisors. The course covers the following topics: nature of scientific inquiry, library skills, formulation and testing of hypotheses, experimental design, statistical analysis of data, human subjects, use of humans and animals in research, and professional responsibility in research grants and funding for research. Pass/Fail

CP8201 Algorithms and Computability
The concepts of algorithms and computability together with techniques for analysis of the efficiency and complexity of algorithms are studied. Logical formalisms and their application in computing environments and the use of logical reasoning in establishing the correctness of implementations of algorithms are discussed. Abstract models are discussed with respect to advanced computational models. 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

CP8207 Special Topics: Core of Computer Science
This special topics course examines selected, advanced topics in areas related to the core areas of computer science series that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor. 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

CP8215 Research Methods in Computer Science
A transition to research-based learning for computer science students designed to assist them in developing a research protocol. The course complements specific research programs devised by the students and their supervisors. Topics may include: the nature of scientific inquiry; information gathering skills; formulation and testing of hypotheses; experimental design; planning; analysis of data; ethical and professional responsibility in research.1 Credit
Not available to Course option students. Only one of CP8310 and CP8215 may be taken for credit toward degree completion.

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

CP8303 Collaborative Computing
Technical and societal perspective on technology enhanced collaboration. Multicasting, Groupware, Computer Supported Cooperative Work, Web technologies and services to support collaboration, social networking environments and the protocols driving them, coordination frameworks, agents to support collaborative activities, and implied security concerns.
1 Credit

CP8304 Distributed Systems
The evolution of high-performance distributed computer systems. Models for distributed processing. Taxonomy and performance evaluation of multiprocessor systems. Interconnection networks. Memory and I/O system for multiprocessor architectures. Performance of distributed systems. Architectural issues of distributed database systems. 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

CP8306 Presence Through Robotic Interaction
Teleoperators, telepresence, telebotics. Remote interaction and manipulation. Environmental, societal and personal presence. Factors influencing presence and the concept of "situation awareness". The course is highly interactive and will involve the creation of mechanisms for the remote interaction with real remote environments in order to establish a sense of presence. Participants will be expected to create robotic presence systems as well as critically examine systems described in the literature. 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

CP8309 Special Topics: Emerging Computer Science
This special topics course examines selected, advanced topics in areas related to 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

CP8310 Directed Studies in Computer Science
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 wishing to take the class would be assigned a suitable class advisor most familiar with the specific area of interest. 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
Not available to Course option students. Only one of CP8310 and CP8215 may be taken for credit toward degree completion.

CP8311 Genetic Programming
The focus of the course is on genetic programming (GP), a subfield of evolutionary computation. GP is a computational technique that harnesses the mechanisms of natural evolution -- including genetic recombination, mutation, and selection - to synthesize computer programs automatically from input/output specifications. The goal of the course is to prepare and engage the student as quickly as possible in original research in this field. 1 Credit

CP8312 Directed Studies: Intelligence and Robotics
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

CP8313 Directed Studies: Networks
This course explores theoretical, practical and experimental (if applicable) problems in great depth in areas of computer and communication networks with emphasis on the aspects of computer networking and its application related to the discipline of Computer Science. Doctoral students must present the 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

CP8315 Special Doctoral Topics: AI & Robotics
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 in the field of Artificial Intelligence and Robotics. 1 Credit.

CP8316 Special Doctoral Topics: Networks
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 in the field of Networking. 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

CP9102 Doctoral Seminar
The purpose of the Doctoral Seminar is to provide students exposure to the latest research, issues and findings related to the discipline of Computer Science. The seminar will consist of invited guests and talks by experts from industry, academia and graduate students themselves. Students will have an opportunity to improve their writing and critical thinking skills through assigned work associated with the seminar topics. All students are required to attend and actively participate in seminars every semester for a total of six semesters. A doctoral candidate must give two publicly announced research seminars on his/her thesis research. The student's supervisor(s) and at least one other member of the student's Dissertation Supervisory Committee must attend this seminar. The quality of the student's presentation will be graded on a Pass/Fail basis. Each student will be required to pass each research seminar presentation. Pass/Fail

DATA SCIENCE AND ANALYTICS

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		**Credits**
Major Research Paper (MRP)		(Milestone)
DS8005	Seminar: Soft Skills, Research and Communication	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
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

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." Pass/Fail

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. 1 Credit

DS8005 Seminar: Soft Skills, Research and Communication
The course will focus on communicating and presenting data analysis results. It aims at building the competency in story telling from the numbers. 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

DIGITAL MEDIA

First offered in Fall 2013

CURRICULUM

Master of Digital Media

DEGREE REQUIREMENTS		Credits
Collaborative Workshop		Milestone
Major Research Project/Paper		Milestone
DG8001	Foundations of Digital Media	1
DG8002	Digital Media Environments	1
DG8003	Interaction Design Digital Media	1
DG8004	Digital Media Entrepreneurship	1
DG8005	Interpersonal Communication	1
2 electives		2

ELECTIVES

		Credits
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
DG8301	Funding New Ventures	1
DG8302	Creating a Business Plan	1
DG8306	Digital Project Lab	1

COURSE LISTING

Collaborative Workshop
This eight-week long, intensive “boot camp” will introduce students to fundamental concepts and skills required to successfully manage projects in dynamic, agile, multidisciplinary team environments relevant to the digital media industry. Course work will be a mixture of classroom instruction and team projects. This is a Milestone. Pass/Fail

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. Pass/Fail

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

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.

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. Antirequisites: 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. Antirequisites: 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

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	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	Master Class Seminar	1
One Advanced Theory elective		1
One Communication & Design elective		1

ELECTIVES

Advanced Theory		**Credits**
DM8301	Adv Topics in Hist. of Docmtry	1
DM8302	Cult of Avt Grde Mdrns Discnts	1
DM8303	Hist/Historiography: Vis Arts	1
DM8304	Dig Media: Theortical Framewrk	1
DM8305	Dbs, Arcs, Virt Exprnce of Art	1
DM8306	Studies in Culture, Perception	1
DM8307	Representational Media	1
DM8308	Activist and Social Change Documentary	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
DM8310	Directed Studies: Communication and Design	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 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 the 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

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 the History of Documentary
The history of documentary can be understood entirely 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 historical study of the evolution of documentary's truth claims from the 1890's to the present day. Informing this historical study 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

DM8304 Digital Media: Towards a Theoretical Framework
As digital media evolve, critical theory struggles to either keep pace or develop unifying-field theoretical constructs. This course looks at critical writings on digital media, with a particular focus on publications and on-line sources from the last decade. Relations

between developments in critical theory and the rapid evolution of the technologies of digital media are actively tracked throughout the course; as are ways in which digital media aggregate to form new collections of digital documents. 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

DM8306 Enabling Technologies and the Illusions of Knowledge: Studies in Culture and Perception
This course looks at ways in which enabling technologies increase the malleability of visual records and visual documents. Image politics, culture wars and new forms of propaganda are critically examined in this context, as are these issues in relation to the larger issues of accuracy in representation and the verifiability of virtual documents. 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

DM8308 Activist and Social Change Documentary
A historical, textual, and thematic look at the culture and philosophy of activist and social change documentary, via a range of genres and approaches – ethnographic, essay-style, social realist, poetic, experimental, labour, feminist, and others. We will look critically at early forms of social realism, ethnography and verite and the emergence of self-reflexive forms of political documentary. The contemporary rise in popularity of political documentary, and its migration to digital platforms will also be examined. 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 Master Class Seminar
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

EARLY CHILDHOOD STUDIES

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
Master's Research Paper*		(Milestone)
CS8901	Research Methods in 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	Designing Curriculum	1
CS8903	Children Families Communities	1
CS8922	Leadership-Educational Change	1
CS8923	Social Justice in Education	1
CS8924	Inclusion: Issues in Assessment	1
CS8926	Risk and Resilience	1
CS8927	Social/Political Contexts for ECEC	1
CS8928	Transformative Literacy	1
CS8929	Childhood Bilingualism	1
CS8930	Social Research with Children	1
CS8931	Children and Canadian Policies	1
CS8932	Children, Technology and Play	1
CS8933	Directed Studies in ECS	1
CS8934	Special Topics in ECS	1
CS8935	Human Services 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
IS8921	Equity for Newcomers: Schools	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 Methods in ECS
This course will help students critically evaluate research studies and design a research project of their own. They will demonstrate their understanding by providing rationales for their selected approach, strategy, and related methodological decisions. 1 Credit.

CS8902 Designing Curriculum
Students will learn principles of curriculum design and key factors that shape curricula. They will identify inclusive practices, and learn to adapt specified curricula to meet the needs of diverse learners in different educational settings. 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 in Education
Students will explore the role of discourses and practices including or excluding children and their families in schools and other social institutions. Students will examine ideologies and theories, such as emancipatory leadership, social justice, critical realism and cultural capital. They will develop a knowledge base for the pursuit of social justice as explicit and essential educational 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

CS8927 Social/Political Contexts for ECEC
This course will explore social and political factors shaping early childhood and care programs in Canada (ECEC). Historical and international perspectives will be used to examine government, voluntary sector and market roles in ECEC. The effects of different policies on early learning for children, parents, women, and early childhood educators will be examined. Students will have opportunities to conceptualize their roles as advocates for ECEC. 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 Childhood Bilingualism
This course builds on first language acquisition concepts and theories. It explores bilingualism in young children from linguistic, political, social, historical and educational perspectives. The course focus is on dual language learning in a specific population: newcomer and immigrant children, who face personal, social, linguistic and academic challenges in new language environments. Instructional practices will be reviewed. Students are provided with an opportunity to conduct a linguistic-based field project. Prerequisite CLD206 or undergraduate course in language acquisition. 1 Credit

CS8930 Social Research with Children
Building on the core course in research methods, 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 Aboriginal children and public policies that specifically affect the children of newcomers. 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, Technology and Play
This course investigates and examines critical perspectives on children's digitally- and technologically-mediated play culture. Students are introduced to ideological, historical, social, pedagogical and cultural themes, including: autonomy, agency, and power, with an emphasis on the central role of adults in the mediation, conceptualization, design, and production of children's learning and play with technology. 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. 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

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 Human Services 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. Social determinants of health and cross cultural perspectives will form a conceptual framework upon which to explore notions of health and well-being. Through a critical evaluation of research and relevant policies, this course will review the evolution of pediatric care over time and consider current risks to children's well-being. 1 Credit

ECONOMICS

CURRICULUM

Master of Arts – International Economics and Finance

DEGREE REQUIREMENTS		**Credits**
Master's Research Paper		(Milestone)
EF8100	Mathematics and Statistics Review	(Non-credit)
EF8901	Microeconomics	1
EF8902	Macroeconomics	1
EF8903	Applied Econometrics	1
EF8904	Financial Theory	1
Two elective courses (or 1 if both Fields chosen)		1 or 2
One (or both) of the following Fields:		
Field I - International Finance		
EF8911	International Finance	1
Field II - International Trade & Policy		
EF8931	Int'l Trade Theory, Policy	1
ELECTIVES (2, or 1 if both fields chosen)		
EF8912	Country Risk Analysis	1
EF8913	Empirical Topics in International Finance	1
EF8914	Financial Econometrics	1
EF8915	Int'l Corporate Finance	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)
PhD Seminar		(Milestone)
EF8100	Mathematics and Statistics Review	(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 Macroecoomics 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

Group B		**Credits**
EF8913	Empirical Topics in International Finance	1
EF8914	Financial Econometrics	1
EF8932	International Trade-Imperfect Comp	1
EF8933	Empirical Topics Int'l Trade	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
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 Research Paper
The student is required to complete a research paper on a topic related to his/her field of specialization (international trade or international finance). The research topic is selected in consultation with the student's supervisor, 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 and monitored by a supervisory committee. 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

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

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. This is a Milestone. Pass/Fail

EF8100 Mathematics and Statistics Review
All students who have been admitted to the International Economics and Finance program must demonstrate competence in quantitative methods by passing a preliminary course in mathematical economics. The course will review some of the mathematics and statistics used in graduate economics courses. Course material will be provided both in class and on the web during the last two weeks of August and the first week of September. Attendance is highly recommended but not compulsory. This is a pass/fail, non-credit course for which there will be an exam during the first month of studies in the program. Students who fail the course can rewrite the exam before the end of the first term. Students who fail on their second attempt 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. 1 Credit

EF8902 Macroeconomics
This course is an introduction to graduate macro economics 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 macro economics 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. 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. Required knowledge: econometrics software packages such as TSP, EVIEWS, SAS, or STATA. 1 Credit

EF8904 Financial Theory
This course is designed to provide graduate students with a broad overview of Finance as an academic discipline. The course covers optimal portfolio decision-making, financial instrument valuation (stocks, bonds and derivative securities), and the basic elements of corporate finance. Specifically, we will consider CAPM, arbitrage pricing theory, CCAPM, martingale pricing theory, and basic derivative pricing theory. There will also be a brief introduction to asset pricing in markets with frictions.
Antirequisite AM8201. 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. 1 Credit

EF8912 Country Risk Analysis
This course introduces the students to the theory and practice of managing cross-border lending and international investment risk. The course gives a comprehensive coverage of the analysis and reporting of sovereign creditworthiness, political risk, current account analysis, statistical credit-scoring methodologies, loan valuation, portfolio management and regulatory supervision. Several case studies will be used, including the Mexican Peso crisis and the collapse of the markets in South East Asia.
Anti-requisite: ECN 821. 1 Credit

EF8913 Empiriclal 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 instructor permission. 1 Credit

EF8914 Financial Econometrics
The purpose of this course is an introduction to the theory and econometric techniques that are necessary to undertake empirical analysis of financial time series. Topics include univariate linear and nonlinear stochastic models such as ARMA processes, ARIMA processes, ARCH-GARCH processes, martingales and random walks. 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. Empirical application of these techniques will be done using data from the Canadian and/or international financial markets. Students of this course are expected to have a solid background in econometrics and have working knowledge of an econometrics package such as EVIEWS, TSP, Stata or SAS. Prerequisite EF8903 or equivalent, or instructor permission. 1 Credit

EF8915 Int'l Corporate Finance
The purpose of this course is for students to understand the dynamics of international corporate finance by concentrating on the financing and investment policies of multinational corporations. We will examine how to evaluate international projects which require large investments and calculate the cost of capital. We will investigate the costs and benefits of issuing securities on international markets. Other topics include international portfolio diversification, taxation issues and functions of offshore centres. 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. 1 Credit

EF8931 Int'l Trade Theory, Policy
(International Trade Field)
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. 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. 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. 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. 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 NAFTA 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 NAFTA and the WTO. Prerequisite: EF8901. 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. Prerequisites EF8901 or equivalent, EF8902 or equivalent, or instructor 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 course provides an introduction to nonparametric methods used in econometrics. Nonparametric methods are statistical techniques which do not require the researchers to specify a functional 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 issues. Prerequisite EF8903 or equivalent or instructor 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 instructor 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

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. 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. 1 Credit

EF9903 Advanced Econometrics I
This course is composed of two parts. The first half of this class is to be an introduction to probability and statistical theory. The second half of this class is to be an introduction to the econometrics at graduate level. Prerequisite: EF9904 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.
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. Prerequisites: EF9901 and EF9921. 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. 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 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. 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. 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. 1 Credit

EF9910 Advanced Topics in Int'l Trade II
A continuation of the topics in EF 9905. Prerequisites: EF9901 and EF9921. 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. 1 Credit

EF9921 Advanced Microeconomics II
he goal of the Advanced Microeconomics I and II sequence is to provide a firm microeconomic foundation, and the necessary toolkit, for advances doctoral studies in Economics. We will analyze consumer theory, producer theory, decision theory, game theory, the economics of information, and general equilibrium theory. We will learn how to use these tools correctly when applying economic analysis to the real works. This is the second course in the sequence. Prerequisite: EF9901. 1 Credit

EF9922 Advanced Macroecoomics 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. 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. 1 Credit

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	Eneergy 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		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**
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
EE9010	PhD Research Seminar in ELCE	
Four Elective credits		4

(Only one elective credit may be a Directed Studies course)

ELECTIVES		**Credits**
EE8102	Signal Detection Theory	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
EE8112	Digital Waveform Compression	1
EE8113	Statistical Time Series Anal	1
EE8114	Optical Commun & Networks	1
EE8115	Network Engineering Anlys	1
EE8119	Wireless Communications II	1
EE8120	Applied Optimization Technique	1
EE8121	Wireless Networks	1
EE8122	Opto-electronic Devices	1
EE8123	Radio Frequency Circuits Syst.	1
EE8201	Computer Vision	1

EE8202	Digital Image Processing I	1
EE8204	Neural Networks	1
EE8205	Embedded Computer Systems	1
EE8207	High Perform Comp Sys Design	1
EE8208	Arch Synth & Des of Dig Sys	1
EE8209	Intelligent Systems	1
EE8211	Advanced Topics in Comp Networks	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
EE8301	Linear System Theory	1
EE8306	Fund Robot Dynamics & Control	1
EE8401	Computer Methods Pwr Sys Analysis	1
EE8403	Adv Topics in Power Systems	1
EE8405	Power Sys Stability & Control	1
EE8406	Electric Motor Drives	1
EE8407	Power Converter Systems	1
EE8408	Switch Mode Power Supplies	1
EE8409	Electromagnetic Theory	1
EE8410	Power Electronics	1
EE8412	Advanced AC Drive Systems	1
EE8413	Adv Digtl Contrl Of Power Elec	1
EE8414	Lightning: Modelling/Detection	1
EE8415	Distribution System Analysis	1
EE8416	Modeling and Control of Power-Electronic	1
EE8417	Vector Control of Rotating Machines	1
EE8418	Antenna Theory and Design	1
EE8501	VLSI System Design	1
EE8502	CMOS Mixed-Mode Circuits and Systems	1
EE8503	VLSI Circuits & Sys for Comm	1
EE8504	VLSI Dsgn Automtn & CAD Tools	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
EE8609	Sel Topics: Computer Sci II	1
EE8610	Sel Topics: Biomedical Engr II	1
EE8901	Smart Grids	1
EE8902	Demand Management, Conservation	1

EE8903	Eneergy Use and Storage	1
EE8904	Electricity Markets	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." 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 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." Pass/Fail

Candidacy Examination
The oral examination will be conducted by the supervisory committee and will consist of two parts: one part focusing on the candidate's' fundamental knowledge of the proposed research and the other focusing on the research proposal. Typically the supervisory committee members will develop the questions that examine both fundamental and dissertation-specific knowledge. Normally the examination is 3 hours. This is a "Milestone." Pass/Fail

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." Pass/Fail

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 and do an oral presentation on a research topic. Pass/Fail.

EE8102 Signal Detection Theory
Classical and statistical detection theory, multiple hypotheses, composite hypotheses, sequential analysis. Classical estimation theory. Representation of random processes. Detection of signals (white and coloured noise, signals with unknown parameters). Estimation of signal parameters. Linear filtering theory, estimation of continuous waveforms. Wiener and Kalman filtering. 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. 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

EE8112 Digital Waveform Compression
Numerical representation of waveform information; common waveform communication systems; statistical models used for waveforms; Differential PCM, motion estimation/compensation for video compressions. Transform coding: run length coding, Huffman and arithmetic coding, segmentation/ contour/edge based coding; pre-processing and post-processing strategies. Vector quantization. Sub-band coding and wavelet transform. Zero trees. Channel concerns: robustness, error recovery, masking video/image bit rate source models. Coding of two-level graphics. Review of standards: JPEG, MPEG, H.261. 1 Credit

EE8113 Statistical Time Series Analysis
Time-series analysis and spectrum estimation constitute an important area of digital signal processing that finds applications in sonar and radar, geophysics and oil exploration, biomedicine, speech and image processing. This course will cover the basic principles and wide variety of signal processing techniques developed for time series and spectral analysis. Topics include: definitions of power spectrum; conventional spectrum estimation methods, maximum likelihood method of Capon; maximum entropy method; parametric modeling of time series; AR and ARMA spectrum estimation; harmonic decomposition techniques; duality between spectral analysis and array processing; signal and noise subspace methods in array processing. Higher-order spectral analysis methods and applications. 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

EE8115 Network Engineering and Analysis
This course covers queuing theory, self similarity and flow control. The topics to be covered are: review of basic continuous-time and discrete-time probability distributions: exponential distribution and Poisson process, concept of Markov modeling, Markov chain and basic queueing theory, analysis of M/M/1, M/M/m, M/M/m/m, M/G/1 models, network traffic modeling: an introduction to self-similarity, fitting of different self-similar traffic models, network traffic flow control and engineering: additive-increment and multiplicative-decrement (AIMD) etc., analysis of different designs based on AIMD. 1 Credit

EE8119 Wireless Communications II
This is an advanced course on wireless communication. The topics to be covered include: communication over fading channels, equalization, synchronization; Spread Spectrum Systems; Co-channel Interference Control: power control, interference statistics and performance analysis, opportunistic communication over fading channels; Diversity Techniques: time, space and frequency diversity and macro diversity; Multi-antenna and Multi-carrier Systems: MIMO channels and capacity, OFDM and MC-CDMA; State-of-the-art development in digital mobile communication systems. Prerequisite EE8107/EE8109 or equivalent 1 Credit

EE8120 Applied Optimization Techniques
This course covers the following topics: Linear and nonlinear programming, unconstrained optimization techniques such as gradient techniques (steepest descent, conjugate gradient, Newton-Raphson) and constrained optimization techniques such as Lagrange multiplier, quadratic and dynamic programming, least square techniques, integer and mixed-integer programming. NP-complete problems: branch-and-bound as well as heuristic algorithms, graph colouring, partitioning, and maximum matching. Bounds, variable priorities, special ordered sets and search algorithms (random search, binary search, genetic algorithms, and tabu search). Optimization algorithms in Electrical and Computer Engineering areas will be discussed in depth. 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

EE8201 Computer Vision
This course introduces the fundamental concepts for computer and robot vision. Mainly, intermediate and high-level vision processes will be covered, including shape feature extraction, representation and aggregation. Basic concepts of surface orientation, optical flow, and texture will be introduced for 3D shape analysis. Shape from shading, contour, texture, motion and stereo techniques will also be covered. Special topics in application of computer vision including automated visual inspection; robotic vision, autonomous navigation, etc. will be presented. 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

EE8207 High Performance Computer System Design
This course will focus on the design of high performance computer systems. Topics covered include: Advanced pipelining and parallelism issues, including branch prediction, instruction and data level parallelism; Advanced processors including superscalar, VLIW, speculative, vector and multi-processors; Physical limitations and scalability issues; Real-world examples including MMX technology, PowerPC and Alpha architectures, and DLX architectures. The lab projects include using CAD tools to design a branch predictor and trace cache for Pentium 4 processor. Antirequisites: ELE818, COE818. 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

EE8211 Advanced Topics in Computer Networks
Topics covered include design and operation of computer networks, Gigabit Networking, Fiber Optics and SONET standards, Cell Networking, Asynchronous Transfer Mode, Wide Area and Local Area Cell networks, Gigabit packet networks, Applications,

Internetworking Protocols, Traffic Modelling ad Performance Issues, Switch Architectures and current research areas. Practical aspects of network software design are also discussed. 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. 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.

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

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

EE8306 Fundamentals of Robot Dynamics and Control
This course provides a comprehensive treatment on the fundamentals of robotics, particularly in the kinematics, dynamics and control of robotic manipulators. Topics include: forward dinematics, homogeneous transformation; the Denavit-Hartenberg representation of linkages. Inverse kinematics: closed-form and numerical solutions. Differential motion; Jacobian matrix; singularities. Dynamics: the Euler-Lagrange formulation. Trajectory generation. Motion and interaction control of robotic manipulators. Actuators and sensors. Antirequisite ELE869. 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

EE8406 Electric Motor Drives
Characteristics of dc and ac motors, speed-torque profiles of motors and loads, motor models, principle of motor speed control, field and armature current control for dc motor drives, V/F control and field oriented control for ac motors, motor drive dynamics, digital implementation, drive performance evaluation, industrial application examples. 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 Switch Mode Power Supplies
Flyback converters, forward converters, bridge converters, Cuk converters, pre-regulators, inrush control, start-up methods, overvoltage and undervoltage protections, foldback current limiting, output filters, transformer design, induction and choke design, current mode control, stability. 1 Credit

EE8409 Electromagnetic Theory
The course will cover the following: Electromagnetostatic fields, Maxwell's equations, 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 matrices, oblique incidence. Waves between parallel planes, rectangular and circular waveguides, microwave cavities, Antennas, antenna characteristics. 1 Credit

EE8410 Power Electronics
A course on microprocessor-controlled solid state converters. Major topics include: solid state switching devices, dc-dc switch mode converters, diode & thyristor rectifiers, current & voltage source inverters, industry applications and microprocessor programming techniques. Typical control schemes for these converters will also be discussed. Important concepts are illustrated with design projects. 1 Credit

EE8412 Advanced AC Drive Systems
The topics include general configurations of voltage source inverter (VSI) and current source (CSI) fed drives, reference frame theory, space-vector and dq-axis models of ac machines, dynamic behavior of ac machines, principle of field orientation, indirect and direct field oriented controls for VSI and CSI drives, direct torque control, sensorless control of ac drives, observers for flux, torque and speed, and simulation and design of closed-loop control systems. 1 Credit

EE8413 Adv Digital Control of Power Electronics
A course on the design of digital system for power electronic applications. Major topics include are: digital implementation of switch mode power supplies, digital control of active filters, voltage compensators, reactive power compensator, PWM rectifiers, and AC motor drive systems. The course focus on the digital design of the control system including modeling, digital signal processing,

digital filter design and digitalize of an analog control system. The implementation includes the DSP/FPGA control system, A/D conversion, gate signal generation and hardware design of the digital control system. 1 Credit

EE8414 Lightning: Modelling and Detection
This course will cover the following: Thunderstorm electrification mechanisms, electrical structure of thunderstorm clouds, the electrostatic dipole and tri-pole models. The mechanisms of the downward-initiated lightning flash and tall-structure lightning. Mathematical modelling of the lightning return stroke current, calculation of the lightning-generated electromagnetic pulse (LEMP). Measurement of the lightning current and its generated LEMP. Lightning detection systems. Deleterious effects of lightning and protective techniques. 1 Credit

EE8415 Distribution System Analysis
This course will cover: Review of Transmission line modeling, Transformer modeling, load modeling, system representation using Y-Bus and three phase systems, Power Balance equations and solution using Newton-Raphson's method, Voltage solution of distribution systems using Ladder Network theory and such methods, Voltage solution of distribution systems using specially constructed system of equations and their solution through Newton-Raphson's method, Maximum line loadability indicator and their relevance to renewable energy resources, Network Reconfiguration and methods. 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.

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.

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

EE8501 VLSI System Design
This course deals with the design of CMOS integrated circuits using deep sub-micron CMOS technology at the system level. The course consists of two essential components: theory and project. The theoretical component consists of : advanced topics on modeling of MOS transistors, modeling of interconnects (lumped, distributed RC, distributed RLC, and transmission line models), impedance matching techniques, layout techniques for high-speed digital and mixed analog-digital circuits, clock generation and distribution on chip, power distribution on chip, analog and digital grounding of mixed analog-digital circuits on chip, I/O and pad design, packaging and ESD protection, switching noise, and high-speed data links. The project component consists of design, layout, and simulation of CMOS circuits using state-of-the-art CMOS technology and CAD tools. Antirequisite: ELE863 1 Credit

EE8502 CMOS Mixed-Mode Circuits and Systems
This course deals with the design of CMOS mixed mode circuits and systems. Key components include switching noise, analog & digital grounding, ESD protection, cock and power distribution, fundamentals of ADCs, Nyquist ADCs, introduction to switched-capacitor networks, over-sampling ADCs, dynamic element matching, time-mode ADCs and decimation filters.
Antirequisite ELE724. 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 1 Credit

EE8504 VLSI Design Automation and CAD Tools
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 heristic 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

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

EE8609 Selected Topics in Computer Science II
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

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 and do an oral presentation on a research topic. Pass/Fail.

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	7
THESIS Option		
	Master's Thesis	(Milestone)
	Four Elective credits, with a minimum of one from Group A and one from Group B	4

Doctor of Philosophy

DEGREE REQUIREMENTS		**Credits**
Doctoral Research Seminar		(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
ES8902*	Wtr Pollution Control Process	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

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
ES8924	Environmental Mgmt Systems	1

ES8925	Dec Making and Strat Plan Mgmt	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	Bus. Fundamen. for Envir. Professionals	1
SA8921	Spatial Analysis of Land Resources	1
SA8922	Remote Sensing and Spatial Data	1
SA8923	Land/Geographic Information Systems	1

Group C: Environmental Applied Science and Management		**Credits**
ES8950	Indepdt Study Env Sci and Mgmt	1
ES8951	Interntl Env Field Research	1

***Platform Courses:** The program offers a set of five platform courses in environmental applied science. They are structured to provide both foundational knowledge and advanced study at the graduate level. These courses enable students from a wide range of academic backgrounds (including Geography, Public Health, Urban and Regional Planning, and Environmental Studies) to take engineering and applied science subjects. Students who successfully complete a Platform Course will have the option of enrolling in advanced applied environmental science courses in subsequent semesters.

COURSE LISTING

Master's Project
The research project option is intended for students following a professional career path in environmental applied science and management, and is typically conducted in an applied setting. In the project, students propose and carry out advanced work in an industry or a public sector organization under the direction of a faculty supervisor and a project supervisory committee. The research project is submitted in a written report 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 an advanced examination of a topic in the environmental applied science and management areas. 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". Pass/Fail

Doctoral Research Seminar
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 seminar normally held in the Winter semester. The seminar 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

ES8902 Water Pollution Control Processes
This course will examine the sources of water pollution including wastewater, non-point source pollutants and storm water run off. The analytical characterization of contaminants will be covered for the major sources and control processes will be reviewed with a focus on wastewater processes. This will be followed by a review of the most relevant technologies used to treat industrial and municipal effluents. (Platform Course) Antirequisite: CV8200. 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

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

ES8924 Environmental Management Systems
This course examines the legal, economic and ethical reasons for the development, implementation and monitoring of a comprehensive, location-specific Environmental Management System (EMS). An EMS enables an organization to systematically identify environmental concerns and address them. The elements of a generic EMS are explored: planning and risk assessment phases; establishment of a policy; the outline of organization arrangements; design of the array of programs that address specific sets of environmental concerns such as production methods, energy use and waste disposal; and the development of a program of periodic environmental audits. The requirements of ISO 14000 are explored. Issues relating to the integration of EMS with quality management systems and occupational health and safety systems are discussed. Antirequisite: ME8148. 1 Credit

ES8925 Decision Making/Strategic Plan. in Mgt.
This course presents methods in tackling decision making problems and strategic planning issues in engineering and management. Topics in quantitative decision theory such as influence diagrams, decision trees, subjective probability assessment, and the role of information in decision making including Bayesian analysis are discussed. Multi-criteria decision making techniques such as multi-attribute utility theory and Analytic Hierarchy Process are covered. Key steps and end results of the strategic planning process are analysed. Formulating planning assumptions, analysing opportunities, setting objectives, developing strategies and implementing strategic plans are discussed. Case studies are an integral part of the course. 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 Business 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. The course focuses on providing students with a general knowledge of how a business works by exposing them to the various functional areas of an organization and the strategic process. Topics include the current types & environment of businesses, leadership and organization, accounting and finance, marketing, operations, strategy and responsible business. 1 Credit

ES8950 Indepdt Study Env Sci and Mgmt
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. Antirequisite: ES8951. 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. Antirequisite: ES8950. 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

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	Ethics and Sustainable Design	1
FS8106	Oral History and Ethnography	1
FS8107	The Fashioned Body	1
FS8108	Virtual Design	1
FS8109	Art in Fashion	1
FS8110	Diversity in Fashion	1
FS8111	Special Topics Fashion Studies	1
FS8112	Directed Studies in Fashion	1

Restricted electives

Students may select up to two of these electives		**Credits**
FS8201	Advanced Colour Theory	1
FS8202	Creativity in Design	1
FS8203	Curation and Exhibition	1
FS8204	Design, Text and Ideas	1
FS8205	Human Centered Design	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 Ethics and Sustainable 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 Oral History and Ethnography
Oral history and ethnography techniques allow us to research hidden or undervalued aspects of the experience of making, purchasing and wearing clothing. Dress is both a public and private expression of our selves, a form of nonverbal communication which often goes unrecorded in traditional literature on fashion. This course gives students the practical and theoretical skills to conduct a series of oral history interviews and write a research paper based on their findings. It will prove particularly effective in investigating topics such as sub-cultural styles, ethnicity, disability and sexuality in contemporary Canadian society. 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 Virtual Design
This course explores developing technologies that have created a new environment for design. 'Virtual' markets, whether online, interactive, or gaming based, have provided a new market economy. Increasingly, fashion has proved to be an important component of this economy. This course will provide a theoretical overview of the phenomenon, placing the virtual world in a social and historical context. Practical aspects of designing for this market will be considered and students will create an avatar, create clothing, and display this in an online fashion show. 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 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.

FS8201 Advanced Colour Theory
This course begins with a conceptual review of basic colour theory and reviews issues studied in earlier courses such as colour systems, interaction and harmony. The course will provide students with advanced knowledge in the following specialized areas: colour and lighting, colour psychology/emotions, symbolism, forecasting, branding, visual merchandising, graphic design, ethnic colour usage, science, measurement, technology, management, and careers in colour. Exclusion: FSN501. 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. Exclusion 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. Exclusion FSN 711. 1 Credit

FS8204 Design, Text and Ideas
This course introduces students to the area of Visual Culture, focusing on key subjects in art and design and their relationship to social theory in the Modern period. Visual signifying systems such as symbolism, iconography and semiotics will be covered, with an emphasis on art and design that engages with social, ecological or environmental issues. Exclusion FSN 503. 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

IMMIGRATION AND SETTLEMENT STUDIES

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**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
IS8933	Ethical Issues: Migratn & Sett	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

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

IS8901 The Canadian Immigration Experience
This course examines the Canadian immigration experience as an interplay of government policy towards newcomers, and the lives immigrants have made for themselves through migration. Key themes explored in the Canadian approaches to immigrant admission and integration include the significance of state authority, economic interests, presumptions of race and gender as drivers of immigration policy. Transnationalism is then emphasized as central to understanding the experience of immigrants attached to both Canada and their homeland. 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

IS8933 Ethical Issues: Imm and Sett
To be developed. 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

JOURNALISM

CURRICULUM

Master of Journalism (2 Year Program)

DEGREE REQUIREMENTS		**Credits**
Major Project		(Milestone)
JN8101	The City: Reporting, Writing	2
JN8102	Internship	2
JN8103	Rsrch Methods for Journalists	1
JN8104	Urb Poli and Soc for Journalists	1
JN8105	Journ Prac: Critical Approach	1
JN8107	Standards of Journalists' Care	1
JN8108	Journalism Workshop	1
One half-credit from Skills Modules		0.5
Two Credits from Journalism Electives		2
Two Credits from Advanced Journalism Electives		2
Two Credits from Advanced Specialized Electives		2
One Credit from Communication & Design Electives		1

Master of Journalism (Accelerated Stream)

Not Offered 2011/12

DEGREE REQUIREMENTS		**Credits**
Major Project		(Milestone)
JN8103	Rsrch Methods for Journalists	1
JN8104	Urb Poli and Soc for Journalists	1
JN8105	Journ Prac: Critical Approach	1
JN8107	Standards of Journalists' Care	1
JN8108	Journalism Workshop	1
One Credit from Communication and Design electives		1
Two credits from Advanced Specialized Electives		2

SKILLS MODULES		**Credits**
JN8110	Skills: Radio	0.5
JN8111	Skills: Copy Editing	0.5

ELECTIVES		**Credits**
Journalism		
JN8201	Broadcast Journalism	1
JN8202	Digital Journalism	1
JN8203	Magazine and Feature Writing	1
Advanced Journalism		
JN8301	Advanced Newspaper Journalism	2
JN8302	Advanced Broadcast Journalism	2
JN8303	Advanced Magazine Journalism	2
JN8304	Advanced Online Journalism	2
JN8310	Journalism Masthead	2
Advanced Specializations		
JN8109	Directed Studies	1
JN8401	Television Documentary	2
JN8402	Adv Rsrch Mthds: Invst Techniq	1

JN8403	Business Journalism	1
JN8404	International Journalism	1
JN8405	Health and Science Journalism	1
JN8406	Visions of Literary Journalism	1
JN8407	Radio Documentary	2
JN8408	Advanced Magazine Editing	2
JN8409	Journ & the Political Arena	1
JN8410	Justice and the Courts	1
JN8411	Photojournalism	1
JN8412	Podcasting	1
JN8420	Special Topics: Journalism	1
IS8922	Changing Multicult Mosaic: GTA	1

Communication & Design

CD8310	Topics in Cross-Cultural Comm	1
CD8320	Media Lang: Forms and Apprches	1
CD8330	Audiences and the Public	1
JN8106	The History of News	1
MP8110	Innovation and Growth in Media Industries	1

COURSE LISTING

Major Project
The student is required to complete a Major Project. This is to be a substantial and original work of journalism, demonstrating mastery of the chosen medium and competence in carrying out research. It is not required that the Major Project be published, but it should be of publishable quality. The Project's subject matter and methods should also reflect the student's awareness of journalism's important role in civil society. The research topic is selected in consultation with the student's supervisor(s); a formal proposal is submitted for approval; and the research is carried out under the direction of the supervisor(s). On completion, the finished Project (accompanied by a reflective essay) is submitted to the supervisor(s) and one additional reader, who assess and grade it. This is a “Milestone.” Pass/Fail

JN8101 The City: Reporting, Writing
Using the city as a laboratory, students will learn the fundamental skills of journalism by carrying out demanding, practical reporting and writing assignments in various urban locations and settings. Students will learn how to generate and assess story ideas; how to research, observe, interview and otherwise gather information; and how to write for publication, bearing in mind the requirements of clarity, thoroughness, balance, and accuracy. 2 Credits

JN8102 Internship
Each student will be placed as an intern in a professional newsroom. On completing the internship, each student will be required to write a substantial paper of theoretical and practical reflection on his or her experience, focusing on what has been learned about the possibilities of introducing new journalistic forms and approaches into professional newsrooms.
Pass/Fail. 2 Credits

JN8103 Research Methods for Journalists
This course will focus specifically on research methods required for journalism. Students will learn advanced library and bibliographic skills, allowing them to inform themselves quickly about unfamiliar subjects and to identify the most reputable researchers and studies; how to conduct, interpret and assess public-opinion surveys and use other statistical material; the systematic use of electronic databases; specialized techniques such as title searches and corporate searches; methods of interviewing; and how to approach a research problem from multiple directions. 1 Credit

JN 8104 Urban Politics and Society for Journalists
Students in this course will gain a solid base of knowledge about urban affairs, broadly defined, that will help them produce insightful coverage of different aspects of urban society, including business and the arts. The course involves lectures by experts in such areas as municipal politics, citizens’ movements, cultural scenes, and multiculturalism, as well as critiques and analyses of news reporting on urban issues. 1 Credit

JN8105 Journ Prac: Critical Approach
Journalism is recognized as central to the practice of liberal democracy, but is also widely criticized from a variety of perspectives for not living up to its promise. In this course, students will study the major contemporary analyses of journalism. A major goal will be to examine critically the journalistic practices which the students are in the process of learning and to identify ways in which they could be improved. 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

JN8107 Standards of Journalists' Care
This course will examine and compare legal and ethical constraints and dilemmas faced by reporters, editors and producers in fulfilling duties owed to sources, subjects, audiences, peers, and employers. These issues will be probed and debated in light of case studies, readings from legal and philosophical works, and the insights of guests including lawyers,
ethicists and professional journalists. Included will be the law of libel and contempt, and the intricacies of court reporting, such as the treatment of juveniles involved in crimes. 1 Credit

JN8108 Journalism Workshop
In this course, students will explore and develop innovative journalistic forms and produce publishable work in them. Most journalistic organizations regularly seek new ways of reaching and serving their audiences, and representatives of these organizations will be frequent guest speakers. Students working in all media will take the course together. The goal is to introduce students to new ideas and approaches which they can introduce into professional news organizations after graduation. 1 Credit

JN8109 Directed Studies
Individual directed study of subject areas in journalism 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

JN8110 Skills: Radio
In this course, students will learn the basic editorial and technical skills of radio journalism, and will become familiar with its various forms. The course will cover recording technology, sound quality, audio editing, script writing, radio news reports, documentaries and newscasts. Students will produce examples of the major forms of radio journalism. Pass/Fail. 0.5 Credits

JN8111 Skills: Copy Editing
In this course students will learn the essential concepts and skills of copy editing and layout. Subjects covered include editing for style, grammar, accuracy and substance; headlines and display type; basic page design and layout, and the use of pagination software such as QuarkXPress. The different editing practices of newspapers, magazines and websites will be discussed. Pass/Fail 0.5 Credits

JN8201 Broadcast Journalism
In this course, students will learn to produce journalistic work for television. The focus will be on the particular requirements of gathering and presenting information for broadcast. The form of television news will be studied and analyzed, and students will learn to prepare and present their own reports, leading to the presentation of 15-minute news broadcasts. Detailed group and individual critiques of student work will be a key method of learning. 1 Credit

JN8202 Digital Journalism
In this course, students report, edit and produce digital journalism by focusing on: using social media to both collect and distribute sources and information, blogging, writing and editing web-specific news and short features, engaging audiences with SEO and social headlines, building multimedia content and employing other evolving and transforming techniques and strategies. A steady diet of group and individual critiques will play a key role in this learning process. 1 Credit
1 Credit

JN8203 Magazine and Feature Writing
In this course, students will learn to write long-form articles for magazines and newspapers. Examples of award-winning articles will be studied and analyzed, and students will learn to produce their own long-form work. Methods of interviewing and different approaches to narrative structure will be among the topics covered. Detailed group and individual critiques of written work will be a key method of learning. 1 Credit

JN8301 Advanced Newspaper Journalism
This is the central professional course in the program's second year. In it, students will use everything they have learned so far, both practical and academic, to produce a weekly newspaper, *The Ryersonian*. The focus will be on producing highly polished work and on meeting high standards of newsworthiness and thoroughness. Through detailed group and individual critiques, students will reach professional standards of achievement. Leading newspaper journalists will be invited seminar guests and will take part in critiques. Antirequisite: JRN903. 2 Credits

JN8302 Advanced Broadcast Journalism
This is the central professional course in the program's second year. In it, students will use everything they have learned so far, both practical and academic, to produce a twice-weekly television news broadcast. The focus will be on producing highly polished work and on meeting high standards of newsworthiness and thoroughness. Through detailed group and individual critiques, students will reach professional standards of achievement. Leading broadcast journalists will be invited seminar guests and will take part incritiques. Antirequisite: JRN902. 2 Credits

JN8303 Advanced Magazine Journalism
This is the cetral professional course in the program's second year. In it, students will use everything they have learned so far, both practical and academic, to produce an issue of the *Ryerson Review of Journalism*, an award-winning magazine. The focus will be on producing highly polished work. Through detailed group and individual critiques, students will reach professional standards of achievement. Leading magazine writers and editors will be invited seminar guests and will take part in critiques. Antirequisite: JRN95 2 Credits

JN8304 Advanced Online Journalism
This is the central professional course in the program's second year. In it, students will use everything they have learned so far, both practical and academic, to produce a journalistic website e.g. RyersOnline. The focus will be on producing highly polished work and on meeting high standards of newsworthiness and thoroughness. Through detailed group and individual critiques, students will reach professional standards of achievement. Leading online journalists will be invited seminar guests and will take part in critiques. Antirequisite: JRN905. 2 Credits

JN8310 Journalism Masthead
This lab course acquaints students with the challenges of producing daily news and current affairs across multiple media platforms. Students will refine and build on skills in writing, reporting, interviewing, newsroom leadership, journalistic initiative, newsgathering, and the technical skills that accompany information dissemination. Through daily production, students will meet the demands of maintaining an online news site, as well as producing a regular television newscast and a weekly community newspaper. Antirequisites JRN910, JN8301, JN8302, JN8304. 2 Credits

JN8401 Television Documentary
This is a laboratory course in documentary production. The emphasis is on effective storytelling through the medium of the television documentary. Particular emphasis will be placed on the relationship between the audiovisual and written elements of a documentary. Students will form production teams that will plan, write, shoot, and edit documentaries. A significant amount of work will be done outside of class time. Antirequisite: JRN800. 2 Credits

JN8402 Adv Rsrch Mthds: Invst Techniq
In this course, students will learn the theory and various techniques of investigative journalism. The emphasis will be on how investigative journalism serves the profession's civic mandate; how to identify appropriate subjects for investigative approaches; how to gather and analyze relevant data systematically and rigorously; and how to circumvent common obstacles. Antirequisite: JRN315. 1 Credit

JN8403 Business Journalism
This course will prepare students to work as business journalists. Topics covered will include basic economic and financial concepts, Canadian business structure and organization, specific techniques for locating and interpreting financial information and different approaches to business coverage. Toronto is Canada's financial capital, and students will have opportunities to discuss the field with guest speakers from the financial press and the business community. Anti-requisite: JRN502, NNS502. 1 Credit

JN8404 International Journalism
This course will give students an in-depth background in international journalism. It will have a combined practical and academic focus. Topics covered will include the international political and economic system, globalization, and the role of news media in international affairs. Case studies will allow students to develop their knowledge of particular areas of the world or specific international issues. The practical and cultural challenges of working internationally in journalism will be emphasized. Anti-requisite: JRN 506. 1 Credit

JN8405 Health and Science Journalism
This course will give students an in-depth background in journalism dealing with health and science, focusing on the challenges and possibilities of presenting scientific and medical information to a popular audience in a responsible and insightful way. Students will be taught how to assess and interpret statistics and how to locate expert opinion on different subjects. Critical approaches to health and science will also be covered. Anti-requisite: JRN505. 1 Credit

JN8406 Visions of Literary Journalism
Students analyze and critique various historical as well as current conceptions of what literary journalism was, is and should be, in both the United States and Canada. They will be encouraged to think philosophically about the value of taking risks in literary journalism, the need to search for meaning when constructing long-form narratives, the desire to layer nonfiction stories with metaphor, and debate the value of the daily news hook versus what constitutes everyday experience. Anti-requisites: JRN508, ENG520. 1 Credit

JN8407 Radio Documentary
This is an advanced laboratory course in the craft of planning and preparing radio documentaries. Attention is given in the classroom to the technical, editorial, ethical, and artistic issues that are involved in documentary production. Students then go into the field and assemble a variety of radio documentaries that will vary in length, form and technique. Antirequisite: JRN801.
2 Credits

JN8408 Advanced Magazine Editing
This is an advanced laboratory course in which students act as editors and produce an edition of the *Ryerson Review of Journalism*. All aspects of magazine editing and production are covered, including determining the appropriate editorial mix, substantive editing and line editing, fact-checking, proofreading and proof correction, use of display type, art direction and design and all stages of production.Prerequisite JN8303. Antirequisite JRN090. 2 Credits

JN8409 Journ & the Political Arena
How governments work at the local, provincial and national levels, and how journalists can cover them effectively. The watchdog role of the media, the mechanics of government and the relationship between journalists and politicians are explored. While sharing a common lecture, students will be enrolled in labs with a view to the amount of journalism experience they bring, and assignments will be tailored to these differing levels of experience. Anti-requisite: JRN509. 1 Credit.

JN8410 Justice and the Courts
This courses covers the context, professional values and disciplines of court and legal reporting at all levels. Classes may include readings, guest speakers and field practice with the potential for cross-media assignments. Anti-requisite: JRN507, NNS507. 1 Credit.

JN8411 Photojournalism
This course is an introduction to photojournalism with an emphasis on the importance of photographs in the media, print and online. Practice in the production of photographs desired by publications, to include composition, depth of field, and cropping. Antirequisite: JRN201, JRN215. 1 Credit

JN8412 Podcasting
This course introduces the fundamental skills of production and reporting for podcasts. Students will learn how to record and edit audio, to write for broadcast and to produce and perform short news stories. Antirequisite: JRN318. 1 Credit

JN8420 Special Topics: Journalism
A seminar course for special initiatives in the department. Topics will vary from year to year. 1 Credit

Communication and Design Electives
see COMMUNICATION AND DESIGN SECTION

MP8110 Innovation and Growth in Media Industries
This graduate research seminar for media professionals focuses on the Canadian Independent Television Production industry in the context of the larger media industry. The course examines effects of technological change, market dynamics, entrepreneurship, strategy, business models, business processes, firm-level capabilities, regulatory regimes, subsidies and business incentives, and competition in the television production sector. Readings are drawn from business and social science disciplines and business case studies. Students complete a research paper on a selected topic. 1 Credit

LITERATURES OF MODERNITY

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
Major Research Paper OR Practicum		(Milestone)
LM8901	Foundations	1
One Professional Skills Course		1
Four elective credits		4

PROFESSIONAL SKILLS		**Credits**
LM8910	Digital Publishing	1
LM8911	Literary Research Methods	1
LM8912	Modernity as a Public Event	1
LM8913	Writing as a Social Act	1
LM8914	Writing Scholarly Papers	1
LM8915	Writing Fiction	1
LM8916	Writing Literary Non-Fiction	1

ELECTIVES		**Credits**
LM8931	Science, Literature, and Art	1
LM8932	Interfaces: Open Topic	1
LM8933	Literary Theories	1
LM8934	Studies in 18thC Literature and Culture	1
LM8935	Rise of Children's Lit	1
LM8936	Genders, Sexualities, Humans	1
LM8937	Modernisms	1
LM8938	Modernism and Auto/Biography	1
LM8939	Studies in 19thC Literature and Culture	1
LM8940	Modernity and Identity	1
LM8941	Modernity's Others	1
LM8942	Modernity and the Visual: Image and Text	1
LM8943	New Directions: Open Topic	1
LM8944	Diasporic Modernities	1
LM8945	Politics and American Writing	1
LM8946	Psychoanalysis and Literature	1
LM8947	Early Modern Literature and Culture	1
LM8948	Studies in Rhetoric	1
LM8950	Unreal Cities	1

Major Research Paper
The student researches and writes a 35-40-page paper under the supervision of a faculty member. The MRP should be a sustained exploration of a theoretical question. An MRP should involve original approach and research, a critical review of literature in the field, as well as a synthesis of different points of view. The standard evaluation is that of an article in a refereed academic journal and commensurate with other English MA program requirements. The MRP will be evaluated by the supervisor and a second reader, normally also from the same program or another relevant graduate program. This is a Milestone. Pass/Fail

LM8902 Practicum
The Practicum allows students to apply their theoretical knowledge to a practical experience at institutions such as literary magazines, journals, and agencies, libraries, museums, exhibitions, and literacy programs. Students also enroll in a Practicum seminar. Evaluation is based on the external supervisor's evaluation, and a portfolio based on the work undertaken in the practicum. All components must be satisfactory for a student to pass. Evaluation may involve consultation with the on-site supervisor. Pass/fail

LM8901 Foundations
In this team-taught course, students are introduced to key critical debates and theories concerning the literatures of modernity. Topics can include the study of modernity in relation to the following: the subject; science and technology; the metropolis; visual culture; gender and sexuality; ethnicity and migration; politics; others; rhetoric; the everyday and avant-garde; literary production and reception; modernity's modernisms. Pass/fail

LM8910 Digital Publishing
This course provides hands-on experience in presenting cultural artifacts as virtual objects existing in an online environment. Students explore the theories and implementation practices of electronic scholarship in relation to the digital remediation and dissemination of physical materials such as texts, images, audio clips, and film. Topics to be addressed may include digitization, editing, metadata and markup, interface design, visualization, interoperability, and preservation. 1 Credit

LM8911 Literary Research Methods
Students learn to make use of a wide range of literary research methods that may include, but are not limited to, historiography, bibliography, ethnography, humanities computing, and archival theory. Students become familiar with local archival resources and accustomed to working with primary materials, including rare books and writers' collections, as well as with digital archives. 1 Credit

LM8912 Modernity as a Public Event
This course allows students to work collaboratively on the organization of a public project such as a symposium, a conference, a lecture series, the launch of a scholarly website, or an exhibition related to any aspect of literatures of modernity. While the content and theme may differ from year to year, this course trains students in the planning, organizing, budgeting, advertising, and presenting of course content to the public. 1 Credit

LM8913 Writing as a Social Act
Two key assumptions of contemporary writing studies are that writing is both embedded within and constitutive of discourse communities, and that all writing is oriented to action: texts *do* things in the social world. In this course, students examine key theories and methods in writing studies from fields such as rhetoric, composition studies, genre theory, and discourse analysis, to enable them to analyze a variety of real-world texts as socially productive artefacts. 1 Credit

LM8914 Writing Scholarly Papers
This course equips students with the practical skills for academic writing in a range of formats, and for their work on the MRP. Students learn to develop an annotated bibliography, a research proposal, and an outline. The course also familiarizes students with computer-based reference systems and scholarly editing. Students learn to write professional abstracts, to write and present conference papers, and are encouraged to submit their work to scholarly venues. 1 Credit

LM8915 Writing Fiction
This course offers students theoretical and practical training in fiction writing, including genres such as the short story, poetry, and the novel, while providing training and experience in effective critical editing and feedback. Taking advantage of Toronto's vibrant cultural scene, the course helps students to enter the literary community by teaching them how to submit work for publication, encouraging them to participate in readings and book festivals, and introducing them to the publishing industry. 1 Credit

LM8916 Writing Literary Non-Fiction
Public culture is shaped through literary non-fiction in the form of reviews, feature articles, biography, cultural analysis, literary critique and more. This course provides theoretical and practical instruction in the craft of non-fiction writing in contemporary culture, giving students opportunities to engage critically and to produce essays in several formats. Students are introduced to different aspects of print and digital publishing, and learn the practical skills required to seek publication in diverse disciplines. 1 Credit

LM8931 Science, Literature, and Art
This course examines the connection between science, art, and literature. Students investigate how scientific narratives have influenced art and literature, and how they may be seen *as* works of literature. Potential topics include: the historical interaction of science and art; "pseudo-science" such as alchemy and witchcraft; conflicts between humanist and scientific values; and the implications of recent scientific developments such as the patenting of DNA and advances in the technology of cloning. 1 Credit

LM8932 Interfaces: Open Topic
In this course, students examine the interrelationship between literatures of modernity and other art forms such as painting, photography, film, and music. Probing the formal, aesthetic, and sensory innovations of modern systems of representation, students investigate how the written word takes up and responds to the ideas, techniques, and representational strategies already present in other arts. The focus of the course may change from year to year. 1 Credit

LM8933 Literary Theories
Students undertake an in-depth examination of critical theories relevant to the study of literature and modernity, and to the rich and complex intersections of modernity and theory. The course may focus on a survey of theories, or on a particular movement or topic, such as: Russian Formalism and New Criticism; semiotics; reader-response theory; structuralism and post-structuralism; new historicism; postcolonialism; gender and queer theories; postmodernism; theory "after" theory. 1 Credit

LM8934 Studies in 18thC Literature and Culture
The eighteenth century was a period marked by tensions and crises connected to the transition into modernity – between, for example, tradition and progress, passion and reason, sensibility and rationalism. The period saw the emergence of new aesthetic and literary forms, of radical political and Enlightenment thought, and of the modern form of identity known as individualism. Students are introduced to a variety of works including poetry, drama, and the new genre of the novel. 1 Credit

LM8935 Rise of Children's Literature
Students trace the emergence of the modern category of childhood from the later eighteenth century through the 'Golden Age' of nonsense and fantasy in the Victorian period, taking into account literature written for child readers, pedagogical theories, medical and scientific writings on childhood, and legal and political discourses. Students examine writing for–and ideas about–children, in relation to contemporary theories of childhood and to the field of childhood studies more generally. 1 Credit

LM8936 Genders, Sexualities, Humans
This course enables students to explore the changing relationship between being human and being sexual during the modern era. Topics may include: diverse perspectives on the modern body; the genders of literary genres; virtual sexualities, non-human sex, gender politics and animal rights; technology; and the place of the natural in queer aesthetics. The course familiarizes students with theories and methodologies such as genre studies, performativity studies, feminism, eco-theory, queer theory, masculinity studies. 1 Credit

LM8937 Modernisms
Recent theorizing has moved away from a monolithic understanding of Anglo-American modernism to consider a plurality of modernisms expressing multiple forms of experimentation across genre, gender, sexuality, race, and nation. In this course, students investigate some of the variants of literary modernism including the avant-garde, women's modernisms, the Harlem Renaissance, Canadian modernisms, and others. Topics may include urbanization, new technologies, war, expatriate experiences, and the formation of modernist canons. 1 Credit

LM8938 Modernism and Auto/Biography
This course examines auto/biography within the context of modernist aesthetics and culture. Students consider how life writers drew on advancements in psychology, registered shifts in assumptions about gender and sexuality, and experimented with literary forms in order to offer new ways for conceiving of, and depicting, the human subject. In so doing, these writers heralded a uniquely modernist tradition of life writing. Authors studied may include Gosse, Freud, Strachey, Woolf, Brittain, Nin, and Glassco. 1 Credit

LM8939 Studies in 19thC Literature and Culture
With its experiences of industrialization and urbanization, globalization and immigration, human and animal rights movements, and advances in science and technology, the long nineteenth century conceived of itself as a decisive break from the past. Yet, the paradoxes of modernity's engagements with the past can be seen in this period's cultural forms, including architecture, painting, literature, and journalism. Drawing on a range of cultural expressions, students investigate the politics and poetics of nineteenth-century texts. 1 Credit

LM8940 Modernity and Identity
Modern literature and culture probes the notions of autonomous selfhood and stable identity. In this course, students explore modern identities and the practice of writing with a particular focus on the intersections of race and gender, culture and ethnicity. Topics may include: identity, displacement and assimilation; traditions and transitions; diasporic identities; class and ethnicity; memory and identity; and creativity and resistance. 1 Credit

LM8941 Modernity's Others
Students engage with some of the key questions in postcolonial studies, and in particular with the representation of the Other in discourses of modernity. Topics change from year to year and may include: the figure of the Muslim, the (postcolonial) queer subject, the "primitive" other, and the relationship of the Other to narratives of progress, time, and history. Readings are drawn from a range of literary and "popular" texts, including feature and documentary films. 1 Credit

LM8942 Modernity and the Visual: Image and Text
The visual turn that profoundly marked the modern period required new techniques of observation and fresh paradigms for reading. Students undertake an in-depth study of verbal-visual relations in various historical contexts, from the late eighteenth century to the present. The focus of the course may be on one or a combination of the following: the graphic novel; poetry and painting; literary galleries and annuals; technologies of print, book production, and illustration; new media poetics. 1 Credit

LM8943 New Directions: Open Topic
This course allows students to conduct in-depth study into new scholarly directions in literatures of modernity, through the investigation of a single author, topic, or literary movement. Topics are set by the instructor and change from year to year. 1 Credit

LM8944 Diasporic Modernities
This course initiates a dialogue between modernity and the central concerns of diasporic theories and literatures, including language, history, subjectivity, and identity. Students examine diasporic "irruptions" into Western conceptions of modernity to determine how diasporic cultures and experiences reshape contemporary assumptions and fictional practices. The focus of the course will change and may be on any one, or combination, of diasporic cultures, including Caribbean, African, and South, West, and East Asian. 1 Credit

LM8945 Politics and American Writing
Emerson challenged American artists to create works that would articulate and sustain a native culture worthy of the United States' rising presence in the modern world. Fragmentation, migration, and unprecedented intercultural contact — key features of modernity itself — exert considerable pressure on the ongoing politics of American writing. In this course, students address such topics as cultural nationalism, race and American identity, migration and immigration, and the interplay of literature and history. 1 Credit

LM8946 Psychoanalysis and Literature
The theorization of the unconscious and the techniques of psychoanalysis first developed by Freud exert a profound influence on modern literature, as do interpretations of Freud's work. Although modern authors have often explicitly been mindful of psychoanalytic insights, literary criticism has deployed psychoanalysis as a tool in order to understand literary characters, narrative styles, reader-reception, and authorship itself. In this course, students investigate texts by such writers as Freud, Klein, Lacan, Laplanche, Kristeva, and Felman. 1 Credit

LM8947 Early Modern Literature and Culture
The course explores the birth of modernity in the flourishing literary and artistic cultures of the Renaissance. Across various European contexts, students examine such topics as individualism, global exploration and imperialism, the rise of Protestantism, tensions between religion and science, the evolution of the monarch and the state, changing conceptions of gender and sexuality, and new forms of theatre, visual and performing arts. Writers and artists studied may include Machiavelli, Michelangelo, Montaigne, Shakespeare and Milton. 1 Credit

LM8948 Studies in Rhetoric
While "rhetoric" commonly refers to empty or deceptive speech ("mere rhetoric"), in contemporary practice rhetoric forms an intellectual tradition and mode of critical praxis focused on the study of persuasion and action in discursive situations. Students learn about rhetorical theory and criticism by focusing on special topics in rhetoric, such as poetics, public discourse, and medical/scientific discourse, enabling them to trace how textual interactions are shaped by intersecting attitudes, beliefs, knowledge, and motives. 1 Credit

LM8950 Unreal Cities
The metropolis has been central to the experience of modernity for millennia. Students explore such topics as the literary representation of architecture and space, the cosmopolitan imagination, the gender of cities, nostalgia, the divided city, the racialized and gendered city. The course may be organized historically or it may focus on the literature of a particular city or on the city within a specific literary movement such as Romanticism, Realism, or Modernism. 1 Credit

MASTER OF BUSINESS ADMINISTRATION

CURRICULUM

Professional Master's Diploma

DIPLOMA REQUIREMENTS

PMDip Enterprise Information Security, Privacy and Data Protection

		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

Master of Business Administration

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 either the requirements for the *MBA [Global]* or the *MBA/MTI* as set out below

MBA Business Administration [Global]

Core Program		**Credits**
MB8103	Strategy in Intl Bus Environ	1
MB8106	Managing in a Diverse World	1
MB8107	Adv International Marketing	1
MB8108	Reg Gov and Soc Resp Mgmt	1
MB8109	Acctng and Fin for Todays Mngrs	1
MB8600	Rsrch and Commun for Mgrs*	1
MB8602	Invstmts, Portfolio Analysis	1
Three credits from any Specialization or Elective list		3

AND one of the following options:

MB8901	Master's Res Proj/Internship	3
MB8902	International Exchange	3
MB8903	Language and Cultural Training	3

*Students who started the program prior to Fall 2009 may take an additional elective rather than MB6000

SPECIALIZATIONS

International Business		**Credits**
MB8201	Intl Strategic Mgmt Challenges	1
MB8202	Intl Environ Fincl Dcsn-Mkg	1
MB8203	Intl Trade in Goods and Servs	1
MB8204	Intl Negs, Contrg and Rsk Mgmt	1
MB8205	Global Issues	1
MB8206	Internatztn of Retailing	1
MB8207	Special Topics: Intl Business	1

Human Resources Management		**Credits**
MB8301	Strategic HR Mgmt	1
MB8302	Comp and Labour Mrkts	1
MB8303	Comparative Emplymt Relations	1
MB8304	Organizational Change	1
MB8305	Organizational Dsgn and Theory	1
MB8306	Special Topics in HR	1

MARKETING		**Credits**
MB8401	Marketing Management	1
MB8402	Brand Management	1
MB8403	Competitive and Mrkt Analysis	1
MB8404	Managing Customer Relations	1
MB8405	Mktg in Theory and Practice	1
MB8407	Special Topics in Marketing	1

Mining Management		
MB8611	Mining Valuation & Financing	1
MB8612	CSR and Sustainable Mining	1

Real Estate		**Credits**
MB8501	Geo-demographics	1
MB8502	Retail and Commercial Dev	1
MB8503	Business Geomatics	1
MB8504	Rtl Location and Dev Strats	1
MB8505	Lgl Asps of Rtl and Comm Dev	1
MB8506	Real Estate Finance	1
MB8507	Spec Topics Rtl and Comm Devel	1

GENERAL ELECTIVES		**Credits**
MB8105	Wrld Lgstcs and Spply Chn Mgmt	1
MB8508	Hotel Asset Management	1
MB8509	Compar Healthcare Pol and Mgmt	1
MT8220	Adv Project Management	1
MT8411	Media, Consumers and Markets	1
MT8510	Adv Supply Chain Mgt Practices	1
MT8511	Op Mgmt, Process Improvement	1
MT8810	Prod Devel, Commercialization	1
MT8911	Technical Foundation for Mgrs	1
MT8912	Mnging for Max Benefit and Eff	1
MT8913	Sec and Prvcy Mgmt Fundmtls	1
MT8914	Law, Cmplce, Aud and Cert, Comp Crime	1

RESTRICTED ELECTIVES (Approval of the Program Director Required)		**Credits**
MB8701	Advanced International Accting	1
MB8702	Ethics in Finance	1
MB8703	Corporate Financial Analysis	1
MB8704	Legal Aspects of Int Business	1
MB8705	Issues in Information Tech Law	1
MB8706	Ethical Leadership	1

MB8707	Studies in Gbl Supp Chn Mgmt	1
MB8708	Project Management	1
MB8709	Org Theory and Design	1
MB8710	Compensation Management	1
MB8711	Negotiation and Conflict	1
MB8712	Industry Analysis	1
MB8713	Marketing Management II	1
MB8714	Bus Forecasting Techniques	1
MB8715	Decision Models for Managers	1
MB8716	Ret Operation I: HR Challenges	1
MB8717	Ret Operation II: Prod Issues	1
MB8718	Design, Commerce and Culture	1
MB8719	International Retailing	1
MB8720	Issues and Innov Retailing II	1

MBA Management of Technology and Innovation [MBA/MTI]

Core Program

MT8106	Managing in a Diverse World	1
MT8108	Reg Gov and Soc Resp Mgmt	1
MT8109	Acctng & Fin for Today's Mngrs	1
MT8212	Innovation and Org Theory	1
MT8213	Technology and Org Strategy	1
MT8216	Global Markets and Tech Trends	1
MT8600	Research and Communication for Mgrs	1
	OR	
MT8601	Res and Comm for Bus Start-ups	1

Three credits from any Specialization or Elective list 3

AND one of the following Options:

MT8902	Master's Res Proj/Internship
MT8903	International Exchange

SPECIALIZATIONS

Entrepreneurship		**Credits**
MT8809	Venture Financing and Planning	1
MT8810	Prod Devel, Commercialization	1

Information Systems Management		**Credits**
MT8310	Special Topics Info Sys Mgmt	1
MT8311	Adv Tech Integ and Proc Design	1
MT8312	Collaboration and Decision Tech	1
MT8313	Data and Knowledge Management	1
MT8314	Human Factors in Tech Design	1
MT8315	Dir Readings Info Sys Mgmt I	1

Media Management		**Credits**
MT8408	Adv Media, Communication Tech	1
MT8409	Lgl/Policy Issues in Media Ind	1
MT8411	Media, Consumers and Markets	1
MT8412	Core Issue: Media Management	1
MT8414	Dir Readings Media Mgmt I	1

MT8416	Special Topics Media Mgmt	1

Supply Chain Management		**Credits**
MT8509	Special Topics Supp Chain Mgmt	1
MT8510	Adv Supply Chain Mgt Practices	1
MT8511	Op Mgmt, Process Improvement	1
MT8512	Logistics and Inventory Mgmt	1
MT8513	Intro Operations Research	1
MT8514	Dir Readings Supp Chn Mgmt I	1
MT8522	Public Sect Supply Chain Mgmt	1

GENERAL ELECTIVES		**Credits**
MT8103	Applied Research Methods I	1
MT8104	Applied Research Methods II	1
MT8212	Innovation and Org Theory	1
MT8213	Technology and Org Strategy	1
MT8215	Finance, Technology Valuation	1
MT8216	Global Markets and Tech Trends	1
MT8219	Theories of Tech and Orgs	1
MT8220	Advanced Project Management	1
MT8317	Information Architec Theory	1
MT8318	Wireless, Mobile Communication	1
MT8321	Personal Data Privacy	1
MT8322	Data Warehousing Methods	1
MT8323	Customer Relations Mgmt IT	1
MT8324	Info Sys Security and Control	1
MT8326	Adv Re-engineering Methods	1
MT8417	TV Distribution	1
MT8418	Legal Bus Aspects of Media	1
MT8419	Economics of Media	1
MT8420	Legal Issues in Media	1
MT8421	Media Business Studies	1
MT8422	Advertising in Elec Media	1
MT8423	TV Marketing Promotion	1
MT8424	Production Management	1
MT8425	Digital Media in Practice	1
MT8516	Procurement, Supply Chain Mgmt	1
MT8517	Principles of Transportation	1
MT8518	Studies Global Supply Chn Mgmt	1
MT8519	Logistics Management I	1
MT8520	Logistics and Transport Mgmt	1
MT8807	Managing Knowledge and IP	1
MT8808	Consulting Skills	1
MT8901	Directed Readings	1
MT8911	Technical Foundation for Mgrs	1
MT8912	Mnging for Max Benefit and Eff	1
MT8913	Sec and Prvcy Mgmt Fundmtls	1
MT8914	Law, Cmplce, Aud and Cert, Comp Crime	1

COURSE LISTING

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 Acctng
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

MB8103 Strategy in Intl Bus Environ
This course develops pragmatic and dynamic perspectives on functional level, business level, and corporate strategies through the analysis of the internal and external environment. Strategic analytical theories and processes are examined using current business cases in a range of industries. The focus is on creating competitive advantages through strategic control and governance, diversification, effective foreign market entry, creating a learning organization, and fostering innovation and entrepreneurship, all while responding ethically. 1 Credit

MB8105 Wrld Lgstcs and Spply Chn Mgmt
This course provides students with the knowledge of supply chain and operational management necessary for effective managerial decision making. Problem solving topics include leveraging corporate resources on a worldwide basis to deliver goods and services to particular markets, aligning rapidly evolving information and communication technologies to corporate operating plans, and working effectively within the constraints imposed by a variety of host governments and business cultures. 1 Credit

MB8106 Managing in a Diverse World
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, conflict resolution across cultures, approaches to ethics and social responsibility in different cultures, global recruitment, selection and employee repatriation issues. Antirequisite: MT8214. 1 Credit

MB8107 Adv Intl Mktng
This course examines the processes used by marketers to produce, communicate and deliver value to customers, shareholders and society. It focuses on the management of relationships across the spectrum of marketing interactions that benefit the organization, its stakeholders and the community in which it operates. The course provides insight into marketing actions and their impact on customers, markets, firm value and community development including socio-economic well being and sustainability. 1 Credit

MB8108 Reg Gov and Soc Resp Mgmt
This course focuses on corporate social responsibility and ethical management from a legal perspective. 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. Antirequisites: MB8101, MB8102 and MT8108

MB8109 Acctng and Fin for Todays Mngrs
Building on the foundation 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. 1 Credit. Equivalent to MT8109

MB8201 Intl Strategic Mgmt Challenges
This course discusses seminal strategic theory debates. Traditional strategy courses emphasize strategy as a linear process, focusing on the strengths and weaknesses, opportunities and threats that an organization faces, then establishing alternatives with normative assumptions and idealizing radical change. This course challenges the assumptions that strategy is neither sequential, nor conducive to long-term planning. Topics include the "Porter perspective", and how it can be challenged by some of the world's best, and conflicting, strategic writers. 1 Credit

MB8202 Intl Environ Fincl Dcsn-Mkg
This course examines corporate financial issues from a more in-depth managerial and strategic perspective including internationally diversified portfolios and asset allocation decision making, financial instrument valuation, going public as well as multinational fund transfers; identifying and measuring and managing foreign exchange and interest rate risk; multinational tax planning; hedging instruments, including forward contracts, options and swaps. 1 Credit

MB8203 Intl Trade in Goods and Servs
This course examines the importance of the global expansion of trade in goods and services to the Canadian economy. Topics include entrepreneurial to global product development, global and multi market perspectives of branding, competitors, alliances and supply chain integration, the role of representatives, agents and sales offices in foreign markets, the importance of e-marketing, the language of international trade, documentation, insurance and international transport. 1 Credit

MB8204 Intl Negs, Contrg and Rsk Mgmt
This course addresses the importance of recognizing and managing risk exposure in the global environment. It examines risk issues including political or economic instability, non-performance of contract, corporate and industrial espionage, security, emergency and disaster planning, global health threats, environmental risk auditing, cyber risk management, risk exposure of expatriates, payment and collection, trade barriers and specific contractual requirements and safeguards and international dispute settlement. 1 Credit

MB8205 Global Issues
This course addresses the complex contexts of international organizations including private companies, government agencies and non-governmental organizations. Issues examined include trade, conflict, human rights, foreign aid, social investment, international debt, technology transfer, poverty, environment, social development and sustainable development, the roles of international and regional organizations, government policy and domestic and foreign corporations. These themes will be considered in regions of interest. 1 Credit

MB8206 Internatztn of Retailing
This course examines the challenges and opportunities that exist in world wide retailing. Using spatial analysis, students examine the growth of retail concentration and the reach of world wide retailers and compare retailing across international borders. Students are exposed to fast turnaround global supply chain and logistics systems. Topics include geographic, global, city and company perspectives, and necessary approaches to logistics including accessing, assessing and interpretation of market data. 1 Credit

MB8207 Special Topics in International Business
Special topic courses in International Business may be offered in response to students' needs and interests. Topics may include international or intercultural business analysis, new venture management in the industry, and financing ventures.
1 Credit

MB8301 Strategic HR Mgmt
This course offers a framework for strategic human resources management that prepares line managers and HR professionals to align the goals and strategy of the organization with its people management strategies – the most critical sources of sustainable competitive advantages. Topics include the strategic management of human capital, the transformational impact of emerging markets and quantifying the impact of HR on business performance. 1 Credit

MB8302 Comp and Labour Mrkts
Compensation comprises an average of 70% of the total costs of an organization. This course focuses on the processes, issues and techniques for understanding the labour markets and establishing compensation and reward programs within a framework of productivity, equity and economics limitations. Issues include legislation, principles of equity and fairness, job analysis, job evaluation, compensation surveys, benefits and incentives, and international comparisons. 1 Credit

MB8303 Comparative Emplymt Relations
This course provides an understanding of the range of issues pertinent to different industrial relations and employment systems using Canada as a base-line for comparison. It is designed to provide a general background in the subject with particular emphasis on the role of the state, employers, trade unions and workers in a variety of settings and covers a range of topics including collective bargaining, negotiations, grievance and arbitration. 1 Credit

MB8304 Organizational Change
This course provides an overview of the theory and practice of organizational change focusing on the tension between the organization's need for stability and the pressures for change. It focuses on the stages of the change process concentrating on the importance of altering individual attitudes and behaviours, group relationships, and organizational cultures necessary for effective and sustained change. 1 Credit

MB8305 Organizational Dsgn and Theory
This course provides a basic understanding of organizations as entities in the broader social system, what makes them work and how they can be altered to meet the challenges of a changing world. Current perspectives in organizational theory and design are explored with an emphasis on how organizations are affected by their environments, how they are designed and structured, and why they are effective or ineffective in achieving their goals. 1 Credit

MB8306 Special Topics in HR
This course provides students with the opportunity to pursue advanced studies on issues and themes of immediate and current significance in the fields of Human Resources Management. 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 vary in response to changes and trends in the field, availability of specialists and student interest. 1 Credit

MB8401 Marketing Management
This course uses an integrated approach to marketing management using economic, quantitative and behavioural concepts to understand analysis, planning, implementation and control of marketing decisions. The course develops the marketing principles by which products and services are designed to meet customer needs, priced, promoted, and distributed to the end user. The focus is on applying these marketing principles to customers, both internal and external. Topics are discussed with an international lens and a strong sense of social responsibilities. 1 Credit

MB8402 Brand Management
A brand name, and its associated brand equity, is one of the most valuable assets of any firm. The course is designed to increase student understanding of the important issues in planning, implementing and evaluating brand strategies; to provide relevant theories, models and tools for the making of brand decisions, and to enable students to apply these principles to real life cases.
1 Credit

MB8403 Competitive and Mrkt Analysis
This course provides a comprehensive framework, for analyzing the competitive scope of an industry, the industry itself, and the market space that a company occupies within an industry. The course provides students with the necessary analytical tools to evaluate the environment within which a company operates, and an opportunity to apply these analytical skills in a practical situation. The course centres on developing the platform on which a company builds a marketing strategy. 1 Credit

MB8404 Managing Customer Relations
Central to the concept of marketing is marketing behaviour. The course deals with consumer behaviour, information processing, consumer decision making and "consumption" in the broadest sense of the word. Special attention is paid to psychological, psychosocial, sociological and cultural influences on consumer choice, decision processes and context effects that influence consumer behaviour. The fundamental question driving this course is "Who consumes what and why, and what can we do once we know?" 1 Credit

MB8405 Mktg in Theory and Practice
This seminar course reviews writings on contemporary marketing thought, strategy and practice with particular attention to the macro impact of marketing in society. The course is an introduction to the most recent academic thinking in the field of marketing as it applies to current marketing discourse and behaviour. The topics include marketing history, theory, strategy, organization, and tactics in terms of the traditional 4-P's. 1 Credit

MB8407 Special Topics in Marketing
This course uses the latest research and best practice models for an in-depth study of current issues, themes and trends in marketing management. The particular theme, topic and structure of the course vary in response to changes and trends in the field, the availability of specialists and student interest. Antirequisite: MB8406. 1 Credit

MB8501 Geo-demographics
This course examines the conceptual, methodological and practical issues associated with the application of mulitvariate spatial techniques to market area analysis and geo-segmentation. Topics include data sources; geo-demographic market segmentation in theory and practice; marketing projects and future directions in data, technology and applications. 1 Credit

MB8502 Retail and Commercial Dev
This course examines retail and commercial development from the perspective of both North American and international markets. Topics include understanding the retail/commercial structure; the dynamics of retail developments; the future role of downtowns, the challenges of the shopping centre format, the emergence of big/power centre development and mixed use of developments and emerging, high growth economies (e.g. Eastern Europe, China, India, the Middle East and South America). 1 Credit

MB8503 Business Geomatics
This course provides a working knowledge of GIS (Geographic Information Systems); the use of spatially referenced information, and applications of various geo-visualization methodologies to both the planning and management of major retail/commercial developments. The student is trained in the use of GIS software programs (MapInfo; ArcGIS); and given access to the relational databases and spatial information available from the Centre for the Study of Commercial Activity. 1 Credit

MB8504 Rtl Location and Dev Strats
This course examines retail and commercial development from a variety of perspectives. Topics include the principles of store location research; understanding the drivers of the retail economy; creating a retail location database; developing sales forecasting models for the corporation; measuring market saturation and store cannibalization; selecting the appropriate location strategy; closing the deal and portfolio management. 1 Credit

MB8505 Lgl Asps of Rtl and Comm Dev
This course examines the legal implications of retail and commercial property development. Real Property tenure, forms of ownership, creditors' rights, landlord, tenant rights are constrained at law, and may vary from jurisdiction to jurisdiction. Knowledge of this interrelationship are essential for dealing with retail and commercial development issues. This course focuses on the complexity of the real estate field and the tools and techniques necessary to properly structure retail and commercial real estate transactions. 1 Credit

MB8506 Real Estate Finance
This course explores the foundations of real estate mathematics, capitalization rates; property appraisal process and issues related to real property assessment. It also focuses on specific types of real estate development, understanding the pro forma, the effect of leases on value, the role of pension funds and real estate investment trusts and private equity markets in the Canadian real estate industry, and the relation between land value and land use. 1 Credit

MB8507 Special Topics: Retail and Commercial Development
Special topic courses in Retail and Comm. Dev may be offered in response to students' needs and interests. Topics may include international or intercultural business analysis, new venture management in the industry, and financing ventures. 1 Credit

MB8508 Hotel Asset Management
This course will examine the structure and guidelines for planning and development of Hospitality and Tourism projects, destinations and events. Comprehensive planning considers economic, social and environmental elements of tourism. This course also examines the different steps to be considered in the planning process and works to identify the other stakeholders to be considered. Strategic planning as well as planning philosophies, theories and models will be examined. 1 Credit

MB8509 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. Countries studied include the US, UK, France, Germany, Japan and, as a benchmark, Canada. 1 Credit

MB8600 Research and Communication for Managers
This applied course introduces theories and skills of management research and communication. Key research topics include formulating questions, conducting industry analyses and critical literature reviews, quantitative and qualitative methods and report writing. The communication dimensions focus mostly on career-related skills such as writing resumes and cover letters, doing presentations and interviewing. Antirequisite MT8600. 1 Credit

MB8602 Investments and Portfolio Analysis
This course covers analyses of equity, fixed income, derivative and alternative investments. The second half of the course focuses on portfolio management. This course is appropriate for students who want to write the CFA exam. Prerequisite: MB8104 or MT8215. 1 Credit.

MB8611 Mining Valuation & Financing
Prerequisite: MB8104 1 credit.

MB8612 CSR and Sustainable Mining
Prerequisite: MB8104 1 credit.

MB8701 Advanced International Accting
This course will involve an in depth comparison between the practices recommended in Canada for each section of the financial statements and those of a selected foreign country. Students will explore the impact of reporting of an international subsidiary on a Canadian parent company. Students will be contacted prior to the start of the course to select the country they wish to review, however, the number of students assigned to each country will be limited. Antirequisite ACC808. 1 Credit

MB8702 Ethics in Finance
This course introduces students to the practices and codes of conduct involved in finance. The course covers ethical issues and the roles of the corporate financial manager, stakeholders and other participants in the investment industry. Readings and regulations from both academia and practice will be used to illustrate theory. Cases and speakers will be employed to bring a real world perspective to the classroom. Antirequisite FIN800. 1 Credit

MB8703 Corporate Financial Analysis
This course looks at the question of how a financial institution controls and hedges itself against all of the various risks that it faces. The course looks at liquidity management, deposit insurance, capital adequacy, credit risk management, loan securitization, interest rate forwards, futures, swaps, caps, floors and collars and how banks use these derivative products to manipulate its exposure to various types of risk. Antirequisite FIN801. 1 Credit

MB8704 Legal Aspects of Int Business
This course explores legal considerations relevant to entrepreneurs engaged in import or export as well as legal principles applicable to multinational corporations. Topics include: bilateral and multilateral trade agreements including the GATT, the EC and the Canada-U.S. FTA; legal aspects of international sales of goods and financing international sales of goods; forms of business organization abroad; licensing and franchising; international protection of intellectual property; comparative anti-trust legislation; conflict of laws and international settlement of disputes. Antirequisite IBS800. 1 Credit

MB8705 Issues in Information Tech Law
This course focuses on emerging legal problems associated with the growth of information technology in Canada and internationally. It focuses on legal protection of electronic information and technology through patents, copyright, trademarks and trade secrets, and upon contractual issues (electronic signatures, verification, written contracts, and security of information) in the procurement of products and services, focusing on Internet and other e-commerce conduits. Other topics include data protection and privacy, regulation of the Internet, harmonization of law globally, computer crime, and remedies. Antirequisite LAW723. 1 Credit

MB8706 Ethical Leadership
This course examines the vital role that ethics plays at all leadership levels within a company. Students will discover the importance of instilling ethical values as a key to long term success. Exposure to thought-provoking cases and literature will heighten student awareness of the need to develop strong ethical leadership in dealing with customers, the community, employees, peers and the government. Antirequisite MGT802. 1 Credit

MB8707 Studies in Gbl Supp Chn Mgmt
This course will expose the student to many of the topics currently dominating the study of global supply management. Subjects may include: locating potential suppliers; the importance of cultural and communication skills; legal practices; currency factors; logistics; supplier payment, channel payment, and more. Students will be expected to write and present papers on various topics using both primary and secondary research techniques. Antirequisites MGT804 and MT8518. 1 Credit

MB8708 Project Management
This course focuses on how projects contribute to the strategic goals of the organization. The linkages for integration include the process of selection of projects that best support organizational strategy and all the technical and managerial processes to complete those projects. The goals for prospective project managers are to clearly understand the role of project in their organizations and to master project management tools/techniques and interpersonal skills necessary to orchestrate projects to completion. Antirequisite MGT806. 1 Credit

MB8709 Org Theory and Design
The course includes such topics as: organization environment; organic and mechanistic structures; the open system concept; impact of technology; global organization structures and contemporary approaches; management of innovation and change; organizational culture and ethical values; organizational politics, etc. This course aims to provide students with an in-depth understanding of organizational structure and design in relationship to these issues. Antirequisite MHR841. 1 Credit

MB8710 Compensation Management
This course provides theoretical and practical understanding in the development and administration of compensation systems. It examines the concepts and processes of rewarding employees, and focuses on major items of the compensation program, such as (1) Job Evaluation, (2) Compensation Survey, (3) Benefits and Services, (4) Work Incentives and (5) Performance Appraisal. Discussion of topical issues of Compensation Management such as Compensation for Managerial, Professional and Exempt Employees, Information Systems, Government Guidelines and Regulations. Antirequisite MHR749. 1 Credit

MB8711 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. Antirequisite MHR721.
1 Credit

MB8712 Industry Analysis
This course presents a comprehensive framework for analyzing a company's industry. It provides analytical techniques to forecast industry trends, to understand the markets and competitive environment, and to understand the forces that will impact on its future success. An industry analysis is the underpinning for developing a successful strategy, and it provides clarity for the company's position within an industry. Antirequisite MKT731. 1 Credit

MB8713 Marketing Management II
This course provides students with the opportunity to develop an integrated marketing plan for a real company. Students meet with their client company at the beginning of the term to gather background information, then they present the strategic elements of their plan. At the end of the term, they present their complete set of strategic and tactical marketing recommendations. Library and field research is required to supplement background information supplied about the company. Antirequisite MKT802. 1 Credit

MB8714 Bus Forecasting Techniques
This course deals with the application, usefulness and limitations of some of the more important and widely used time series forecasting techniques, including Box-Jenkins. A forecasting project will provide the student with insight into the practical problems of forecasting such as data acquisition, model selection and the analysis and interpretation of results. Analysis will be completed using the appropriate software and platforms. Antirequisite QMS703. 1 Credit

MB8715 Decision Models for Managers
This is a practical course dealing with the application of Management Science to business decision problems. Emphasis is placed on the study of mathematical models of common business situations and the related mathematical solutions. Topics include Queuing Theory, Markov chains, and Simulation. Practical application of these topics in the areas of marketing, production and finance are stressed. Analysis will be done using appropriate software and platforms. Antirequisite QMS751. 1 Credit

MB8716 Ret Operation I: HR Challenges
This course will focus on the challenges related to managing cross-cultural human resources in conjunction with store operations strategies, in a large or small retail organization. Topics will include: teamwork, customer service issues and strategies; policies and procedures and their impact on motivation, creativity and corporate culture; franchisee/franchiser relations; best practices from both North American and international perspectives; effective communication of store operations needs within the organization. Antirequisite RMG900. 1 Credit

MB8717 Ret Operation II: Prod Issues
This course focuses on planning and maximizing the performance of the store operations function for both small and large retailers to profitably meet target consumers' needs. Topics will include: retail metrics, in-store marketing and merchandising, determining and meeting the needs of the local consumer, shortage control, personnel scheduling and cost control, financial planning and analysis of single-unit and multi-unit retail operations, productivity analysis, impact of shopping centre management needs on the store operations function**.** Antirequisite RMG901. 1 Credit

MB8718 Design, Commerce and Culture
This course provides an in-depth reflective understanding of the human designed environment, from a retail perspective. Concentrating on the main historic movements of the twentieth century, the course will address the ways in which the products of a culture are seen as representations of its cultural identity and value system. Changing social and cultural patterns, developing technology, and the economic climate will be explored. Ethical and environmental implications of the retail environment will be discussed. Antirequisite RMG905. 1 Credit

MB8719 International Retailing
This course will examine the trend towards international retailing. A number of themes will be examined. These will include: the growth of international retail organizations; the internationalization of the Canadian retail economy; Canadian retailer experience in the U.S. - lessons and prospects; methods of appraising international retail market opportunities. Students will be expected to develop an appreciation of one particular international market in the course through the development of a case. Antirequisite RMG906. 1 Credit

MB8720 Issues and Innov Retailing II
This seminar course will examine the spectrum of strategic responses of Canadian retail organizations as they move in a competitive environment towards the 21st century. An in-depth investigation and analysis of key innovations in retailing from North American and global environments will be conducted. Ethical entrepreneurship within the framework of a competitive retail economy will be explored. Topics covered each year promote reflective thinking and will vary according to the most current issues and innovations. Antirequisite RMG908. 1 Credit

MB8801 Special Topics: Tourism, Hospitality Management
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Tourism & Hospitality 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8802 Special Topics: Health Services Management
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Health Services 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8803 Special Topics: Accounting
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Accounting. 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8804 Special Topics: Finance
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Finance. 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8805 Special Topics: Law and Business
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Law and Business. 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8806 Special Topics: Sustainability
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Sustainability/Social Responsibility. 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MB8900 Master's Thesis
This option is appropriate for students considering a career in Academia or research. Students choosing this option must take the research methods elective, and produce a formal proposal for approval. Original research can be undertaken at one of the Faculty's centres or institutes. Standard thesis format is required and there will be an oral defense. Pass/Fail

MB8901 Master's Research Project/Internship
This major research project is normally tied to a work placement or contract with an organization. These projects usually focus on the application of theory to practice and the analysis of a particular market, organizational or management issue. Where appropriate, these projects can be undertaken in small groups. A proposal for this project must be approved in advance. An oral defense may be part of the requirements. Pass/Fail

MB8902 International Exchange
Students choosing this option must have advanced approval. Two approved graduate courses are taken in an approved university. Students may undertake research under the direction a faculty member on an approved topic and are required to produce a reflective paper that incorporates theory and practice (eg. cross-cultural comparisons, case studies, organizational analyses). Pass/Fail

MB8903 Language and Cultural Training
Language training must be approved in advance and may focus on either improving existing fluency or developing fluency in a second language. Students take a minimum of a two credit course and produce a project paper based on a literature review and data collection in the second language. Pass/Fail

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	Tech Com Go-To-Market-Project	2
Two Engineering track Elective credits.		2

ELECTIVES		
EI8001	Biotechnology Start-Ups	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 Biotechnology Start-Ups
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. 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. 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. 1 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. 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. 1 Credit

EI8010 Tech Comm & Go-To-Market Project
The supervised project is a major component of the MEIE program and work on the project commences at the start of Term 3 of the academic program and continues throughout the remaining duration of the program. The student will be assigned a project supervisor (PS), a technical mentor (TM) and a business mentor (BM). The students will spend a substantial amount of their time working on their project at the iBoost Zone or other Ryerson Zones and with customers in the market place. 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

MASTER OF SCIENCE IN MANAGEMENT

CURRICULUM

Master of Science in Management

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		**(**Milestone**)**
MT8000	Research Seminar	pass/fail
MT8103	Applied Research Methods I	1
MT8104	Applied Research Methods II	1
Four credits from any Specialization or Elective list		4

SPECIALIZATIONS

Information Systems Management		**Credits**
MT8310	Special Topics Info Sys Mgmt	1
MT8311	Adv Tech Integ and Proc Design	1
MT8312	Collaboration and Decision Tech	1
MT8313	Data and Knowledge Management	1
MT8314	Human Factors in Tech Design	1
MT8315	Dir Readings Info Sys Mgmt I	1

Media Management		**Credits**
MT8408	Adv Media, Communication Tech	1
MT8409	Lgl/Policy Issues in Media Ind	1
MT8411	Media, Consumers and Markets	1
MT8412	Core Issue: Media Management	1
MT8414	Dir Readings Media Mgmt I	1
MT8416	Special Topics Media Mgmt	1

Supply Chain Management		**Credits**
MT8509	Special Topics Supp Chain Mgmt	1
MT8510	Adv Supply Chain Mgt Practices	1
MT8511	Op Mgmt, Process Improvement	1
MT8512	Logistics and Inventory Mgmt	1
MT8513	Intro Operations Research	1
MT8514	Dir Readings Supp Chn Mgmt I	1
MT8522	Public Sect Supply Chain Mgmt	1

GENERAL ELECTIVES		**Credits**
MT8103	Applied Research Methods I	1
MT8104	Applied Research Methods II	1
MT8212	Innovation and Org Theory	1
MT8213	Technology and Org Strategy	1
MT8215	Finance, Technology Valuation	1
MT8216	Global Markets and Tech Trends	1
MT8219	Theories of Tech and Orgs	1
MT8220	Advanced Project Management	1
MT8317	Information Architec Theory	1
MT8318	Wireless, Mobile Communication	1
MT8321	Personal Data Privacy	1
MT8322	Data Warehousing Methods	1

MT8323	Customer Relations Mgmt IT	1
MT8324	Info Sys Security and Control	1
MT8326	Adv Re-engineering Methods	1
MT8417	TV Distribution	1
MT8418	Legal Bus Aspects of Media	1
MT8419	Economics of Media	1
MT8420	Legal Issues in Media	1
MT8421	Media Business Studies	1
MT8422	Advertising in Elec Media	1
MT8423	TV Marketing Promotion	1
MT8424	Production Management	1
MT8425	Digital Media in Practice	1
MT8516	Procurement, Supply Chain Mgmt	1
MT8517	Principles of Transportation	1
MT8518	Studies Global Supply Chn Mgmt	1
MT8519	Logistics Management I	1
MT8520	Logistics and Transport Mgmt	1
MT8807	Managing Knowledge and IP	1
MT8808	Consulting Skills	1
MT8809	Venture Financing and Planning	1
MT8810	Prod Devel, Commercialization	1
MT8811	Special Topics: Entrepreneurship	1
MT8901	Directed Readings	1
MT8911	Technical Foundation for Mgrs	1
MT8912	Mnging for Max Benefit and Eff	1
MT8913	Sec and Prvcy Mgmt Fundmtls	1
MT8914	Law, Cmplce, Aud and Cert, Comp Crime	1
MB8207*	Special Topics: Intl Business	1
MB8306*	Special Topics in HR	1
MB8407*	Special Topics in Marketing	1
MB8507*	Spec Topics Rtl and Comm Devel	1
MB8801*	Spec Topics: Tourism, Hospitality Mgmt	1
MB8802*	Spec Topics: Health Services Mgmt	1
MB8803*	Spec Topics: Accounting	1
MB8804*	Spec Topics: Finance	1
MB8805*	Spec Topics: Law and Business	1
MB8806*	Spec Topics: Sustainability	1

* For course descriptions, go to the *Master of Business Administration* program section.

COURSE LISTING

MT8000 Research Seminar
Pass/Fail

MT8103 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

MT8104 Applied Research Methods II
This course is a continuation of MT8103. 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

MT8106 Managing in a Diverse World
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. Antirequisite: MT8214. Equivalent to MB8106. 1 Credit

MT8108 Reg Gov and Soc Resp Mgmt
This course focuses on corporate social responsibility and ethical management from a legal perspective. 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 requisites: MB8101, MB8102 and MB8108

MT8109 Acctng & Fin for Today's Mngrs
Building on the foundation 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. Anti-requisites: MT8215, MB8104. 1 Credit. Equivalent to MB8109

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. Antirequisites 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

MT8215 Finance and Tech Valuation
Students learn how to interpret financial information to inform managerial decisions within the organization. The course covers concepts related to technology valuation, building business cases, and examining R&D productivity. Particular attention will be focused on risk management, and the course will use current cases as a basis for discussion. Antirequisite MT8207. 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

MT8219 Theories of Technology and Organizations
This course will offer graduate students the opportunity to read, under the guidance of senior research faculty, seminal research in the field of information systems. The expectation is that students will find this course an effective vehicle to develop broad and deep knowledge of their field of study upon which they can develop a research program and thesis. 1 Credit

MT8220 Advanced 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. Note: this course assumes a basic understanding of the traditional (PMI prescribed) project management methodology and is not introductory. If you do not have that, please see the library reserve material and/or speak with your professor ahead of time.
Antirequisite: MT8205, MT8206. 1 Credit

MT8310 Special Topics Info Sys Mgmt
Special topics courses in Information Systems Management may be offered in response to students' needs and interests. 1 Credit

MT8311 Adv Tech Integ and Proc Design
This course allows students to further develop their technological competence, with a focus on understanding the key technologies widely adopted across enterprises and beyond. The course develops an understanding of business process design, and adopts a problem-based approach to enable students to comprehend, and respond to, the challenges that arise in integrating multiple technologies within the enterprise and across inter-organizational networks. Antirequisite MT8210. 1 Credit

MT8312 Collaboration and Decision Tech
This course provides an overview of the development and usage of decision support systems (DSS), data mining and collaboration technologies. Students will learn how database technologies support managerial decision making, and will understand the role of the data warehouse in supporting DSS and data mining applications. Antirequisite MT8301.
1 Credit

MT8313 Data and Knowledge Mgmt
This course covers the basic principles and practices of knowledge management, the technology to support knowledge sharing and the issues in designing and implementing a value-based knowledge management system in an organization. Topics include: understanding today's knowledge economy and knowledge workers; enabling knowledge creation; knowledge maintenance: accuracy, currency, accessibility; developing a knowledge management strategy; information policies, measuring value, change management and human factors in implementing a knowledge management system.
Antirequisites MT8302, MT8303. 1 Credit

MT8314 Human Factors in Tech Design
User-centred theory and approaches to understanding and designing technologies will be introduced. Emphasis will be placed on the effective application of these approaches in a development and management of technology context to suit all users including those with disabilities. Students must apply the theoretical constructs to a practical design or development project. Antirequisite MT8209. 1 Credit

MT8315 Dir Readings Info Sys Mgmt I
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to Information Systems Management. Working with a faculty supervisor, the student will develop an initial bibliography to focus the study, and will complete a research paper on the selected topic of interest. Antirequisites MT8901, MT8316. 1 Credit

MT8317 Info Arch Theory
This is an advanced foundational course in information architecture theory, focusing on application of theories to systems design projects involving database or knowledge management systems. This course explores theoretical perspectives on information architecture principles by demonstrating the application and development of an information architecture required to support an overall IT and Business Strategy. This course utilizes an experiential learning design and will provide students the opportunity design an information architecture model for a complex system. Antirequisite ITM613. 1 Credit

MT8318 Wireless/Mob Comm
This course explores concepts and applications of wireless technologies and systems, and mobile and wireless communications within a business environment. It provides an understanding of complex wireless and mobile systems by exploring individual components used to build these systems. These include network management, integration of wireless and wireline networks, system support for mobility, computing system architectures for wireless nodes, and user interfaces appropriate for handheld portable devices**.** Antirequisite ITM704. 1 Credit

MT8321 Personal Data Privacy
The purpose of this course is to identify personal data privacy issues involved in information technology management and examine a full spectrum of possible as well as feasible solutions (technological and business) to safeguard personal data privacy. This course will explore the principles of data privacy, the threats to privacy, international and national policy, particularly privacy enhancing technologies as they apply to the management of information systems and eBusiness. Antirequisite ITM725. 1 Credit

MT8322 Data Warehousing Methods
This course explores fundamental principles that underlie the wide spectrum of activities and processes associated with discovering useful knowledge from aggregate data in a business setting. The course structure is based upon three major technologies that enable the transformation of data into knowledge: data warehousing, OLAP, and data mining. The emphasis of the course will be on the application, implementation and integration of the technologies with the business process and strategic goals of the enterprise. Antirequisite ITM729. 1Credit

MT8323 Customer Relations Mgmt IT
This course addresses the growing need of business for experts to help them with the development and implementation of systems at improving customer service and satisfaction with a particular focus on enterprise-wide customer relationship management systems. Students will become familiar with the technical aspects of customer relationship management and business aspects of customer relationship management. Students will develop knowledge in defining business requirements for customer acquisition and retention, identifying, implementing and managing IT enabled solutions. Antirequisite ITM730. 1Credit

MT8324 Info Sys Security and Control
This course considers the technical, operational and managerial issues of computer and network security in an operational environment. Industry best practices relating to computer security including schemes for breaking security, and techniques for detecting and preventing security violations are the core focus of this course. Additional material on the development of appropriate safeguards, the study of different types of security systems and the development of appropriate security for the perceived risk are also introduced. Antirequisite ITm420. 1 Credit

MT8326 Adv Re-engineering Methods
This course introduces concepts and techniques of managing organizational change involving the implementation of information technology, and provides an overview of key change management issues involving IT in organizations. Various approaches for managing conflict and processes for facilitating optimum IT adoption and use will be presented. Planning, innovation, and implementation strategy formulation will be addressed through case studies examining prototypes of IT change management problems**.** Antirequisite ITM601. 1Credit

MT8408 Adv Media, Comm unication Tech
This course surveys contemporary and emerging communication technologies such as Next Generation Network Technologies, Multimedia and Internet Systems and Services, Broadband Satellite Technologies, Wideband Wireless Communication Technology

and Services, and Advanced Intelligent Network Technology and Services, and explores their applications implications for communication and cultural practices. The module encompasses theoretical and applied perspectives. 1 Credit

MT8409 Lgl/Policy Issues in Media Ind
Around the world, rapid changes in the media and communications industries are affecting the legal, regulatory, and policy frameworks within which these industries operate. Business leaders need to understand how competition, ownership, content, contracts, privacy, intellectual property rights, liability, trade, and taxation issues affect their firms. This course provides an overview of these issues in Canada and internationally. Exclusion MT8420. 1 Credit

MT8411 Media, Consumers and Markets
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. 1 Credit

MT8412 Core Issues Media Management
This course provides a comprehensive overview of management issues in diversified media firms. It covers the media value chain, content strategies, supply chain management in media industries, marketing to customers and audiences, advertising strategies, corporate strategy, the impacts of digital media, and HR management in creative firms. 1 Credit

MT8414 Dir Readings Media Mgmt I
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to Media Management. Working with a faculty supervisor, the student will develop an initial bibliography to focus the study, and will complete a research paper on the selected topic of interest. Antirequisite MT8415. 1 Credit

MT8416 Special Topics Media Mgmt
Special topics courses in Media Management may be offered in response to students' needs and interests. Topics may include international or intercultural media management, media industry analysis, new venture management in the media industry, and financing media ventures. 1 Credit

MT8417 TV Distribution
The distributor is essentially the producer's sales person of a program. This course will explore the essential responsibilities of television distributors and their relationship to the producer and investors of programming. Students will learn how and where programs are sold, revenue expectations from various genre and territories, and how to successfully market and promote programming. International markets, contracting, selling, merchandising and administrative details will be reviewed. Antirequisite BDC911. 1 Credit

MT8418 Legal Bus Aspects of Media
Students will learn about the legalities on Internet regulation, website design, information collection, privacy protection, copyright and trademarks on the Internet, trade secrets, and how to determine which country's laws apply when conducting business on the Internet over national borders. They will also learn what to insist on and what to avoid in contracts, and will learn about on-line payment systems and electronic signatures. Antirequisite BDC912. 1 Credit

MT8419 Economics of Media
As the broadcasting and new media industries evolve, old forms of management may give way to new structures. This course will explore trends in entrepreneurship, employment, types of "work" and different management styles in a world of mergers, consolidation and networks. Within different models, the financiers and economic models that support the industry will be reviewed. Antirequisite BDC914. 1Credit

MT8420 Legal Issues in Media
This course will provide students with a general familiarity and 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 law and sports law will also be reviewed, as will government regulation of the broadcasting and multimedia industries. Antirequisite BDC915, MT8408. 1 Credit

MT8421 Media Business Studies
This course will cover general business practices including marketing, finance, accounting, statutes and regulations particularly applicable to the successful operation of small media businesses. A case study approach will be used.
Antirequisite FPN536. 1 Credit

MT8422 Advertising in Elec Media
Students will follow a commercial production from inception to completion. Aspects of advertising to be reviewed include: competitive bidding by agencies; budgeting for commercial production; relationships with production houses; CRTC regulations and broadcaster advertisement codes; and the role of various personnel involved in the bidding, pre-production, production and post-production stages of a commercial. Effectiveness and persuasiveness of commercial content will be explored. Antirequisite BDC901. 1 Credit

MT8423 TV Marketing Promotion
This course will demonstrate how to successfully market television programs, channels and networks to an intended target audience. Students will be introduced to the foundation of knowledge and procedures associated with effective marketing and

promotion techniques. Specific areas of discussion include; brand identity, strategies and tactics for on-air promotion and campaigns, off-air advertising, publicity, use of the Internet and promotional partnerships. Antirequisite BDC906. 1 Credit

MT8424 Production Mgmt
This course will provide an overview of the role of the production manager in film and television. Students will become acquainted with the sophisticated administrative procedures and planning necessary for a successful production. Activities in the four stages of production will be reviewed: development; pre-production; production; post and wrap. Topics include: script breakdown, scheduling, budgeting, industrial relations, facilities and suppliers, location management, accounting, talent and crew unions, contracts, reporting mechanisms and relevant forms and paperwork. Antirequisite BDC910. 1 Credit

MT8425 Digital Media in Practice
The first half of this course provides a review of current and emerging digital media, with particular emphasis on social media enabled by web 2.0 and their impacts on a variety of industry sectors such as marketing and advertising, government and health care. In the second half of the course, students will analyze needs and develop strategies for effective use of new digital media in particular organizational contexts. Topics will include: a review of digital media, consumption of digital media, assessing user needs and feasibility and applications of digital media and measurement. Interdisciplinary teams will undertake a feasibility study for a particular organization and implement a small scale project as part of this course. 1 Credit

MT8509 Special Topics Supp Chain Mgmt
Special topics courses in Supply Chain Management may be offered in response to students' needs and interests.
1 Credit

MT8510 Adv Supply Chain Mgt Practices
Topics include purchasing/supply chain functions, production, distribution and logistics systems, financial considerations, outsourcing and partnership options, competitive bidding and negotiation, contracts, client service and satisfaction issues, etc. Emerging models of buyer-supplier networks and electronic markets will be discussed in terms of the range of key technologies used to support processes within e-enabled corporations. (This course may use the SAP system to demonstrate aspects of integrated IT supply chain management systems.) 1 Credit.

MT8511 Operations Mgmt and Process Improvement
Successful operations management requires a broad understanding of operational strategy, business processes, enterprise systems technologies, and process improvement techniques. Students will gain experience analyzing business processes and designing improved workflows using a variety of enterprise systems (e.g. ERP and CRM), business performance management, project management, and Lean Six Sigma tools and techniques. 1 Credit

MT8512 Logistics and Inventory Mgmt
The course will address advanced supply chain management issues including the following topics: facility location, design of distribution networks, demand forecasting, inventory management, aggregate planning, transportation decision-making, use of IT, sourcing, and pricing. The course will emphasize the use of analytical methods and will also incorporate risk management in business logistics. 1 Credit

MT8513 Intro to Operations Research
This course provides an overview of the basic principles of Operations Research with special emphasis on the paradigms associated with linear programming and queuing theory. These include generic modelling; mathematical modelling; the 'max', 'min', and 'mixed case' simplex algorithms; sensitivity analysis; duality; 'assignment', 'transportation' and 'transhipment' models; and basic principles and models associated with queuing or 'waiting-line' problems. These subjects will be studied from both theoretical and practical perspectives. The class requires background in probability theory and linear algebra as well as some skills in computer programming. 1 Credit

MT8514 Dir Readings Supp Chn Mgmt I
The directed readings course is intended to permit the student to survey a coherent body of literature in an area of study related to Supply Chain Management. Working with a faculty supervisor, the student will develop an initial bibliography to focus the study, and will complete a research paper on the selected topic of interest. Antirequisite MT8515. 1 Credit

MT8516 Procurement and Supply Chain Management
A seminar designed to discuss all activities required to bring materials, parts, and sub-assemblies into and through the enterprise at the lowest possible overall costs with end-user quality requirements. Weekly case assignments integrate the subject matter with the supply management functions. Topics include: the challenge of purchasing and supply management, effective organization, techniques of buying, computerization, Electronic Data Interchange, the web, quality including I.S.O. 9000/14000 standards, specifications and standardization, inventory management, supplier selection, price determination. Antirequisite MGT701. 1 Credit

MT8517 Principles of Transportation
This course examines the field of Traffic and Transportation management in order to provide a professional level of competency for students who wish to pursue careers in Purchasing and Materials Management and/or professional transportation management. Course topics include: transportation regulation and deregulation, transportation economics, buying transportation services, truck transportation, rail transportation, air, marine and pipeline, computers in transportation, customs and excise, dangerous goods, packaging, damage prevention, and carrier claims. Antirequisite MGT803. 1 Credit

MT8518 Studies Gbl Supp Chn Mgmt
This course will expose the student to many of the topics currently dominating the study of global supply management. Subjects will include: locating potential suppliers; the importance of cultural and communication skills; legal practices; currency factors; logistics; supplier payment, channel payment, and more. Students will be expected to present reports on various topics using both primary and secondary research techniques. Antirequisites MGT804, MB8707. 1 Credit

MT8519 Logistics Management I
The goals of this course are to develop an understanding of the logistics process, and to acquire analytical skills in monitoring the ability to provide end customer satisfaction and financial effectiveness. The core competencies in this course start with study of decision strategies in warehousing and inventory management. The course continues with a study of order processing and decision support systems. The course concludes with a look at global logistics and the strategic logistics plan. Antirequisite RMG903. 1 Credit

MT8520 Logistics and Transportation Management
This course explores the application of analytical diagnostic tools to the logistics sphere with a view to optimizing end customer satisfaction and financial effectiveness through optimal use of the supply chain system. Topics include: activity based costing, productivity, total quality management (TQM) and JIT systems, utilization, and performance measures to improve effectiveness and efficiency. The core competencies in this course start with a study of channels of distribution and transportation. Prerequisite MT8519, Antirequisite RMG904. 1 Credit.

MT8522 Public Sector Supply Chain Mgmt
This course examines production and operations management that relate to the creation of goods and services through the transformation of inputs into outputs. It will provide an overview of production and operations management, which includes productivity, competitiveness and strategy, quality management; product and service design; process selection; design of work systems; learning curves; inventory management, maintenance and reliability and project management. Antirequisite MGT401. 1 Credit

MT8600 Research and Communication for Mgrs
This applied course introduces theories and skills of management research and communication. Key research topics include formulating questions, conducting industry analyses and critical literature reviews, quantitative and qualitative methods and report writing. The communication dimensions focus mostly on career-related skills such as writing resumes and cover letters, doing presentations and interviewing. Antirequisite MB8600 and/or MT8601. **1 Credit**

MT8601 Res and Comm for Bus Start-ups
This applied course introduces theories and skills of management research and communication associated with developing plans for a startup business. It is intended to prepare MBA students to pursue a real startup idea for their captain project, the Major Research Paper Business Plan (MRP). Key topics include formulating the concepts behind their startup, conducting critical literature reviews, using quantitative and qualitative data analysis methods to conduct market research, and writing the proposal for investigating the feasibility of their startup idea for the MRP. Students will also master theories of competitive dynamics, building on their core course in strategic management, assessing the methods for identifying competitors and analyzing their methods of competition. The communications dimensions focus mostly on writing and presenting the results of original research on the startup idea. All students are expected to have already achieved the foundational knowledge of basic descriptive statistics, and be familiar with simple inferential statistics such as correlation and multiple regression. Students must begin the course with an idea for a startup.
Antirequisite MB8600 and/or MT8600. 1 Credit

MT8807 Managing Knowledge and IP
Intellectual capital has been defined as any asset that cannot be measured but is used by a company to its advantage. Knowledge, collective expertise, goodwill, brand value and patents usually are absent from conventional financial statements but are critical to organizational success. This course focuses on ways of assessing, organizing, sharing, protecting and leveraging intellectual property (IP) and strategies for knowledge using established knowledge management techniques. 1 Credit

MT8808 Consulting Skills
This course examines consulting industry, consulting firms and consulting process models as they apply to various types of IT consulting engagements, as well as the distinctions between IT consulting practice and general management consulting. Students will study real life consulting projects with practitioners in order to explore consulting skills, roles, skills and services and how they apply to IT projects. This course will be relevant to students who anticipate being external or internal consultants. Antirequisite ITM724. 1 Credit

MT8809 Venture Financing and Planning
This course is mainly a case study course and is designed for students who are interested in venture capital(VC) and private equity (PE) investments as well as for prospective entrepreneurs who have an interest in starting a new venture. This course explores the nature and mechanics venture capital and private equity and ways in which companies and prospective entrepreneurs can assess their options and develop business cases to attract needed financing. 1 Credit

MT8810 Product Development and Commercialization
This module introduces students to entrepreneurial thinking, entrepreneurial processes and the steps in taking a great idea to market. Case studies will be used to demonstrate how entrepreneurs foster innovation within existing businesses and in developing successful new businesses. The principles of entrepreneurship will be outlined, and students will learn how to apply these principles to identify new opportunities, initiatives, and innovations and how to move these innovations to the market place. 1 Credit

MT8811 Special Topics: Entrepreneurship
This course provides students with the opportunity to pursue advanced studies on issues and themes of emerging and current significance in the field of Entrepreneurship. 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 vary in response to changes and trends in the field, availability of specialists, and student interest. 1 Credit

MT8900 Master's Thesis
This option is appropriate for students considering a career in Academia or research. Students choosing this option must take the research methods elective, and produce a formal proposal for approval. Original research can be undertaken at one of the Faculty's centres or institutes. Standard thesis format is required and there will be an oral defense. Pass/Fail

MT8901 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

MT8902 Master's Research Project/Internship
This major research project is normally tied to a work placement or contract with an organization. These projects usually focus on the application of theory to practice and the analysis of a particular market, organizational or management issue. Where appropriate, these projects can be undertaken in small groups. A proposal for this project must be approved in advance. An oral defense may be part of the requirements. Pass/Fail

MT8903 International Exchange
Students choosing this option must have advanced approval. Two approved graduate courses are taken at an approved university. Students may undertake research under the direction of a faculty member on an approved topic and are required to produce a reflective paper that incorporates theory and practice (eg. cross-cultural comparisons, case studies, organizational analyses). Pass/ Fail

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

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 of the remaining Foundation course	2

Major Research Paper Option

	Major Research Paper	Milestone
	Six electives from the Electives list of the remaining Foundation course	6

Doctor of Philosophy in Mathematical Modelling and Methods

DEGREE REQUIREMENTS		
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
AM9000	PhD Seminar	1
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
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

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 student, faculty members, visiting scholars, and guest speakers. In order to pass this course, each student is normally expected to attend all seminars during each term in the program, 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

AM9000: 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. 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.

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
ME8112	Comp Fluid Dyn & Heat Transfer	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
ME8134	Turbulence in Real Fluids	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

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). Pre-requisite: 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

ME8111 Corrosion Engineering
Applications of thermodynamics and kinetics to engineering aspects of corrosion and corrosion control; introduction to forms and mechanisms of corrosion theory; applications of cathodic protection, anodic protection, corrosion inhibitors, coatings and materials selection for corrosion control and design. 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

ME8134 Turbulence in Real Fluids
The first part of this class deals in some detail with the theory of measurements and the analysis of random data. Statistically based functions such as turbulence intensities, correlation functions, energy spectra, are examined in relation to fluid processes. The second phase of this class examines the present level of knowledge of turbulence of fluids in rigid and visco-elastic ducts, without and with superimposed pressure gradients. Properties of real fluids are stressed and considerable emphasis is laid upon experimental results, applying the methods of measurement and analysis outlined above. Two and three-dimensional anemometry techniques are examined and applied. 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

MEDIA PRODUCTION

CURRICULUM

Master of Arts

DEGREE REQUIREMENTS		**Credits**
MP8100	Project/MRP Development	1
MP8101	Creative Research Methods	1
MP8102	Media Production 1	1
MP8103	Media Production II	1
Two Credits from Media Production Electives		2
One Credit from Communication & Design Electives		1
One Credit from Interdisciplinary Electives		1
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 Cse 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

Communication & Design

MP8110	Innovation and Growth in Media Industries	1
CD8310	Topics in Cross-Cultural Comm	1
CD8320	Media Lang: Forms and Apprches	1
CD8330	Audiences and the Public	1
CD8340	Media Writing: Critical & Narrative Forms	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 Entertainmt	1
DM8301	Adv Topics in Hist. of Docmtry	1
DM8303	Hist, Historiography: Vis Arts	1
DM8304	Dig Med: Theoretical Frmewrk	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	Innovation and Growth in Media Industries	1
MP8111	Social Cult Impl of New Media	1
MP8112	Vampires & Drag Kings: Gender, Race, Media	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.” Pass/Fail

MP8100 Project/MRP Development
In this course students begin preparation of a professional production or research project under the direction of faculty members. Students are encouraged to develop projects in coordination with academic researchers as well as industry partners. Building on knowledge gained in the media production courses, this major assignment challenges students to participate in independent, advanced-level applied and/or theoretical research that has potential application in the media industries or contributes to broader public media discourse. Pass/Fail. 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 Media Production I
This course will combine production and theory in order for students to learn how to create innovative, interdisciplinary, and informed media productions and analysis under the supervision of faculty, media experts and theorists. It will include modules in aesthetic history/design and communications theory, as well as lab sessions and workshops pertaining to a variety of audio, video, and new media platforms. 1 Credit.

MP8103 Media Production II
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 etc. In studio sessions, students will select from a series of hands-on seminars on a variety of pieces of media equipment and research "next generation" technological solutions important to the delivery of their professional project. 1 Credit

MP8110 Innovation and Growth in Media Industries
This graduate research seminar for media professionals focuses on the Canadian Independent Television Production industry in the context of the larger media industry. The course examines effects of technological change, market dynamics, entrepreneurship, strategy, business models, business processes, firm-level capabilities, regulatory regimes, subsidies and business incentives, and competition in the television production sector. Readings are drawn from business and social science disciplines and business 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 Vampires & Drag Kings: Gender, Race, Media
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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: 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. Antirequisites: BDC945, RTA945. 1Credit

MP8956 Children's Programming
Students examine children's developmental stages, interests and needs, and study contemporary children's television techniques and the influence media has on kids' lives. The course explores societal and regulatory forces that influence children's programming with guest speakers addressing current issues in the industry. Students conduct original research into media intended for children and adolescents and, with the instructor's permission, may produce a short creative work to demonstrate their research. Antirequisites: 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.

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. Antirequisites: 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. Antirequisites: 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 Eff
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. Antirequisites: 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 post doctoral fellows, visiting lecturers and YSGS appointed faculty to teach specialty courses in the field of Media Production. 1 Credit

Communication and Design Electives
see COMMUNICATION AND DESIGN SECTION

MOLECULAR SCIENCE

CURRICULUM

Master of Science

DEGREE REQUIREMENTS		**Credits**
Master's Thesis		(Milestone)
MS8201	Master's Seminar 1	Pass/Fail
MS8202	Master's Seminar 2	Pass/Fail
Three Credits from Field I or Field II		3

Doctor of Philosophy

First Offered all 2011

DEGREE REQUIREMENTS		**Credits**
Candidacy Examination		(Milestone)
Dissertation		(Milestone)
MS9201	PhD Seminar	Pass/Fail
Three Credits from Field I or Field II		3

Field I: Materials, Surfaces and Interfaces

ES 8909	Environmental Biotechnology	1
MS8101	Adv Analytical Chemistry	1
MS8102	Adv Microscopy and Imaging	1
MS8104	Interfacial Phenomena	1
MS8105	Molecular Recognition	1
MS8106	Materials Science	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
MS8114	Glycobiology	1
MS8115	Organic Methodology	1
MS8116	Meta-analysis for Scientists	1

Field II: Molecular BioScience

ES 8909	Environmental Biotechnology	1
MS8101	Adv Analytical Chemistry	1
MS8102	Adv Microscopy and Imaging	1
MS8103	Genomics and Proteomics	1
MS8105	Molecular Recognition	1
MS8107	Molecular Virology	1
MS8108	Adv Structure Determination	1
MS8109	Directed Studies Molecular Sci	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

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, adhesin-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

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

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. Corequisites 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. Corequisites 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. Corequisites 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. Corequisites 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. Corequisites 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. Corequisites 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. Corequisites 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. Corequisites MN8901, MN8902, MN8903, MN8957. MN8958, MN8959. Antirequisite APN960. 1 Credit

NUTRITION COMMUNICATION

CURRICULUM

Master of Health Science

DEGREE REQUIREMENTS

First Offered Fall 2007		**Credits**
NC8101	Epidem – Nutr Rsrch/Interpretn	1
NC8102	Nutrition and Health Behaviour	1
NC8103	Nutrition Communication Strategies	1
NC8104	Nutrition Communication 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)
1 Credit from the Elective list		1

ACCREDITED PRACTICUM Option: *(first offered Fall 2013)**

NC8300	Professional Practice	1
NC8301	Practicum I	3
NC8302	Practicum II	3

* This option requires enrollment in an additional term for the second practicum (NC8302)

Electives		**Credits**
MN8910	Health & Illness: Theoretc Pers	1
MN8911	Population Hlth & Hlth Promtn	1
MN8920	Health Policy: Comparatv Anal	1
MN8936	Advanced Therapeutic Communication	1
NC8205	Self-Directed Studies	1
NC8206	Special Topics: Nut Comm	1
NC8207	Food Security Concepts	1
NC8208	Gender and Food Security	1

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

NC8101 Epidemiology for Nutrition Research and Interpretation
This course provides a survey of the most frequently used elements of biostatistics (odds ratios, relative risk, meta analysis, etc.), demography, informatics, methodology (study design elements), and epidemiology (classical as well as clinical) used to establish nutrition practice and policy. Emphasis is placed on tools used to convey information about dietary risk, risk management. This course provides opportunity for students to critically evaluate and interpret epidemiologic reports in nutrition literature for methodological and analytical soundness. 1 Credit

NC8102 Nutrition and Health Behaviour
Using an interdisciplinary framework, current theories and concepts of health, health behaviour and behavioural change in individuals, practitioners, and organizations will be explored with current theories of health communication and program evaluation to better understand the processes that may facilitate or impede health maintenance in individuals and populations. Behavioural change practice and its evaluation will be critically examined within systemic, ethical and personal contexts. 1 Credit

NC8103 Nutrition Communication Strategies
Strategies, principles, management and effectiveness of online nutrition communication are examined and applied as students create communications for varied audiences. Students participate in media training and discuss multiple perspectives on professional identity formation. Guidelines for creation of inclusive, accessible nutrition communications are applied. 1 Credit

NC8104 Nutrition Communication Seminar
Seminar activities enhance students' written and oral communication skills. The principles of adult education, self-directed learning, and universal design for learning provide the basis for creation of communication products. Students create individual professional development plans. Guest speakers add varied professional practice perspectives. Pass/Fail. 1 Credit

NC8201 Food and Nutrition Policy
This course provides an overview of contemporary food and nutrition policy issues and debates. It discusses criteria for effective policy and the role of institutions and stakeholders in the policy development process. Students will develop an analytic framework for evaluating policy decision-making, outcomes and impacts. 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

NC8206 Special Topics: Nut Comm
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

NC8207 Food Security Concepts
The continuing reality of hunger and the unsustainable nature of current social, economic and food systems, both locally and globally, make food security an esential concern. This course introduces students to the concepts, programs and policies of food security, in Canada and internationally, with emphasis on the contribution of income, employment, social assistance, urban planning, and food production and distribution systems to finding solutions to food insecurity. 1 Credit

NC8208 Gender and Food Security
This course explores the links between gender and food security. A discussion of the concept of gender and a critical histroical review of the Women's Movement are followed by theoretical views of labour market discrimination and issues in Gender and Development. Topics for discussion include the role of women in agriculture and food production, HIV/AIDS and food security, and proposals for public policies and social action. 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

NC8300 Professional Practice
This course provides students with opportunities to become familiar with the process of competency attainment in external practicums, the roles of dietitians in diverse settings (acute, chronic, long term care, industry, business, community, etc.), interprofessional collaboration, and the standards, policies and legislation governing dietetic practice. Students engage in activities and discussions designed to enhance their readiness for success in achieving the entry-level competencies for dietetic careers. Pass/Fail 1 Credit

NC8301 Practicum I
This course provides students with structured experiences to integrate, build on, and demonstrate their competence related to the Integrated Competencies for Dietetic Education and Practice (ICDEP). Students engage in 4 1/2 days of external rotations and 1/2 day of class weekly. Online study modules and assessments support students' progress. Class discussions provide opportunities for students to integrate their learning, discuss challenges, identify strategies to resolve problems, and demonstrate a collegial and supportive approach to professional practice. This course is graded as Pass/Fail. Successful achievement of all relevant Integrated Competencies for Dietetic Education and Practice is required to pass the course. 3 Credits

NC8302 Practicum II
This course provides students with structured experiences to integrate, build on, and demonstrate their competence related to the Integrated Competencies for Dietetic Education and Practice (ICDEP). Students engage in 4 1/2 days of external rotations and 1/2 day of class weekly. Online study modules and assessments support students' progress. Class discussions provide opportunities for students to integrate their learning, discuss challenges, identify strategies to resolve problems, and demonstrate a collegial and supportive approach to professional practice. This course is graded as Pass/Fail. Successful achievement of all relevant Integrated Competencies for Dietetic Education and Practice is required to pass the course. 3 Credits

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	5
MAJOR RESEARCH PAPER Option		
	Major Research Paper	(Milestone)
	And Seven Elective credits	7

Electives		**Credits**
PH8101	Epistemology	1
PH8102	Metaphysics	1
PH8103	Philosophy of Science	1
PH8104	Philosophy of Religion	1
PH8105	Philosophy of Language	1
PH8106	Philosophy of Mind	1
PH8107	Human Rights and Justice	1
PH8108	Problems of the Self	1
PH8109	Moral Philosophy	1
PH8110	Aesthetics	1
PH8111	Social and Political Philosophy	1
PH8112	Feminist Philosophy	1
PH8113	Philosophy of Education	1
PH8114	Philosophical Education	1
PH8115	Ancient Philosophy	1
PH8116	Topics in Early Modern Philosophy	1
PH8117	19th Century Philosophy	1
PH8118	Philosophy of History	1
PH8119	Phenomenology and Existentialism	1
PH8120	Hermeneutics and Deconstruction	1
PH8121	Recent Continental Philosophy	1
PH8122	Topics in Philosophy	1
PH8123	Major Figures in Philosophy	1
PH8124	Independent Readings	1
PH8125	Critical Theory	1
PH8126	Kant	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; scepticism; 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

PH8103 Philosophy of Science
This course is a study of philosophical issues relating to the natural sciences. The course may examine themes such as the relation between science and its social context, the nature of scientific reasoning, and the scope of scientific descriptions of reality. Specific topics may include: causation, philosophical problems of quantum mechanics, natural laws, the objectivity of science, and the existence of theoretical entities. 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 Problems of the Self
This course is a study of what canonical and contemporary philosophers have said about several central problems concerning the self. Topics may include: free will and moral responsibility; personal identity and survival; the nature of action; moral motivation; rationality and irrationality. 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

PH8113 Philosophy of Education
This course involves the study of the nature, means and goals of education, by way of an engagement with major historical and/or more contemporary philosophical theories of education. Issues to be discussed may include: metaphysical and epistemological underpinnings of education; the relation of education to rational autonomy, liberty, and authority; differences between educating character, practical wisdom, and the theoretical intellect; social and political dimensions of the institutionalization of education, particularly in a multicultural context; the importance of aesthetic education. Some of the typical authors to be studied may include Plato, Aristotle, Comenius, Rousseau, Kant, Schiller, Croce, Dewey, Friere. 1 Credit

PH8114 Philosophical Education
This course involves the study of the nature of philosophical education itself. Through an examination of classic and contemporary texts, students will grapple with perennial questions about what a *philosophical education* is, and what it is for. This course will include an innovative experiential learning module: students will investigate these issues in an applied way, by providing individual and small-group tutoring in a high school philosophy course. Students will be required to submit a final paper which integrates their academic study of philosophical pedagogy with an analysis of their practical experience in the high school classroom setting.
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 in clude: 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

PH8118 Philosophy of History
This course focuses on philosophical conceptions of the nature of history and historical knowledge. Topics may include: the ontological status of the past; identifying the proper focus and unit of study of human history (the individual, the nation, religious, cultural or economic eras, the human species as a whole); whether historical developments are law-governed or contingent; whether historical knowledge is distinct from other forms of knowledge; the narrative structure of history; and the politicization of historical narratives. Authors to be studied may include, among others, Thucydides, Vico, Herder, Hegel, Dilthey, Collingwood, Foucault, Benjamin, Ricoeur, Mink, Carr, White. 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

PH8120 Hermeneutics and Deconstruction
Hermeneutics and deconstruction represent two of the most influential perspectives on language, meaning, and expression to emerge in Twentieth Century philosophy. Despite their important differences, these two philosophical approaches each emphasize

the role that interpretation plays in the constitution of human experience, action, self-identity, as well as in the constitution of all sorts of socio-cultural artefacts (for instance, laws, artworks, science). The course will focus on the work of such philosophers as Heidegger, Derrida, Gadamer, Ricoeur, and Vattimo. 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

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
PP8105 Chem of Photogr Deterioration	1
PP8107 Digital Appl for Collectn Mgmt	1
PP8110 Cataloguing & Registrn Methods	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 opportunities to explore an aspect of film or photographic history, its preservation, or a related museum/collection management practice. The project is a sustained investigation and critical study, either an applied project or an academic argument, that includes a discussion of a research question, situates that research within the appropriate intellectual and historical context, draws upon relevant theories and literature, and provides a technical or methodological analysis. This is a Milestone. Pass/Fail

Field Placement
The Field Placement provides opportunities for students to earn a university credit for relevant work experience at the FPPCM programme's diverse partner institutions. It allows students to apply the theoretical and historical knowledge gained in the academic component of their studies to procedures and practices in museums, archives and libraries to acquire professional collections management and research skills, to participate in institutional projects and to gain appropriate work experience. This is a Milestone. Pass/Fail

PP8001 MRP/Thesis Development Seminar
This course is designed to assist the student with the development of her or his 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 ones. The course is practical in its orientation and is tailored to the needs of each student. Antirequisite: PP8000. 1 Credit. Pass/Fail

PP8010 Internship
While enrolled in the internship at Ryerson, under the direction of a Ryerson faculty supervisor, the student will participate in the current activities or long-term plans of an institution. The internship is normally a minimum of eight and a maximum of twelve consecutive weeks in length. Students are strongly encouraged to undertake their internship during their third term. Students will present the results of the internship in their fourth term. 2 Credits. Pass/Fail

PP8100 History of Photography I
This course provides a survey of the medium's history from early experiments to present. It provides an overview of photography's development and its impact on society as both a cultural and sociological phenomenon. It also familiarizes students with existing histories of photography, and addresses some of the problems of defining a visual history through photographic collections. Photographic theory is introduced to provide a critical context for discussion of these issues. 1 Credit

PP8102 Research Methods
This course aims to improve research skills in the histories of photography and film. In this class, you will learn the methods required to organize and execute historical research. The class includes presentations by specialists, as well as an overview of bibliographic tools. With appropriate exercises, you 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 historical essay. 1 Credit.

PP8103 Photographic Collections
This course is concerned with 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 societal needs, and describes their histories, purposes, intellectual organization, and physical management. The course includes the history of the preservation movement and explains the relationship of preservation to conservation both historically and today.
1 Credit

PP8104 Photographic Materials and Processes: The Nineteenth Century
This course provides 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

PP8105 Chemistry of Photographic Deterioration
This course surveys environmental factors and underlying chemical mechanisms that cause both black and white and colour photographs to stain, fade, or otherwise deteriorate while in storage or on exhibition. Laboratory sessions are used to illustrate the effects of deterioration through exposure to heat, light, humidity, and pollutants. The course provides a fundamental basis for decisions concerning storage conditions, remedial measures, and long-term preservation planning. 1 Credit

PP8106 Photographic Materials and Processes: The Twentieth Century
This course provides detailed investigation of the history and practice of major twentieth century photographic negative and positive processes, including platinum prints, gum bichromate prints, gelatin silver negatives and prints, and colour negatives and prints through lectures, practical demonstrations, darkroom and studio experimentation, and relevant historical literature. 1 Credit

PP8107 Digital Applications for Collection Management
This course will provide students with experience using digital technologies and descriptive standards that facilitate access to film and photographic collections in different institutions - museums, archives, and libraries. Various aspects of digital image creation and file management will be covered. Database development and management, and creation of metadata for preservation and resource discovery are explored in detail. 1 Credit.

PP8108 History of Photography II
Using the collection of George Eastman House or the Art Gallery of Ontario as its basis, this seminar provides the forum for students to investigate specific historical, cultural, or artistic issues arising out the history of photography. This course allows students to gain a greater understanding of history of the medium through detailed examination and interpretation of original materials. Issues of museum collecting and curating are also explored throughout the course. 1 Credit

PP8109 Photographic Preservation
This course provides an overview of the history of philosophy, ethics, concerns, and methods of preservation. It covers materials, tools, sources of supply, and methods of providing protection for photographs through proper mounting, housing, and stabilization procedures. It also covers the purposes and procedures for compiling standard condition reports, and conducting preservation surveys. 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 collection cataloguing and registration methods for museums, libraries and archives with a focus on film and photographic collections. It includes collection management practices, the roles and functions of registrars, cataloguers and other staff, development of cataloguing systems, the role and use of databases in collections management, copyright, insurance and condition reporting. 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. 1 Credit

PP8150: History of Film 1
This course provides a survey of the principle types of film (documentary, fiction, experimental film) and their evolution. This course provides a comprehensive overview of the medium's history from early experiments to the present. It provides an examination of motion picture film's development and its impact on society as both a cultural and sociological phenomenon. It also familiarizes students with existing histories of film, and addresses some of the problems of defining a visual history through film collections. The course will emphasize the evolution of documentary and avant-garde film in Canada, highlighting the traditions of Griersonian documentary and cinema-verite in Canada. Theory is introduced to provide a critical context for discussion of these issues. 1 Credit

PP8151: Film Materials and Processes
This course provides a detailed investigation of the history and practice of major motion picture film processes, including process germane to film restoration, such as: wet-gate printing, optical printing, digital image restoration, digital sound restoration, and redimensioning. 1 Credit

PP8153 Management of Film Collections
This course examines issues around collecting moving images and providing access to moving image collections. Topics include: evaluation of the historical value of films and videos; types of clients; presenting information about the collection; search strategies and use of particular moving image reference sources; evaluation of software for facilitating access to moving image collections. In addition, principles of reference services; descriptive cataloguing of moving images, documentation, and artifacts; and indexing and subject analysis will be taught. The use of metadata in archiving and retrieving media objects will also be explored. 1 Credit

PP8154 Topics in Early Film and its Preservation
This course aims to provide an introduction to the first decade of motion pictures and the developments which helped shape the cinema's subsequent form. It examines the optical devices of the early 1800's, early experiments in motion capture and the work of Thomas Edison and Lumiere brothers as well as William Dickenson, Georges Melies, Birt Acres and others. Key collections of early film, such as the Library of Congress Paper Print collections will be discussed. 1 Credit

PP8155 Issues in Film Curation and Exhibition
This course is designed to provide students with an overview of issues and policies related to the curation and exhibition of film. It covers 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 and specialty film societies. The importance of exhibiting film prints will be stressed. 1 Credit

PP8156 Film Production Processes
A survey of film/media production processes for film archivists. The changing technologies of film making will be explored, including a history of colour processes and sound formats with a view to assessing the implications of these different technologies for moving picture archivists. 1 Credit

PP8206: Topics in Film Preservation: Orphan Films
The Library of Congress's 1993 film preservation study drew attention to the preservation needs of unprotected materials, often termed "orphan films." Orphan films include many newsreels, regional documentaries, avant-garde and independent productions, amateur works, and scientific and anthropological footage. To a large degree, the preservation of these films has fallen to nonprofit and public organizations. This course will examine the role of such films as a factor in the growing appreciation of film as a cultural and historical document, and collections policies of libraries, museums and archives in regard to this category of film works. 1 Credit

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

PROFESSIONAL COMMUNICATION

CURRICULUM

First Offered Fall 2010

Master of Professional Communication

DEGREE REQUIREMENTS		**Credits**
Master's Research/ Paper		(Milestone)
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	Adv Editing, Document Design	1
AND 3 elective credits		3

Electives		**Credits**
CD8310	Topics in Cross-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 Advanced Editing and Document Design
This course will appeal to students who wish to acquire professional-level expertise in editing and document design. Drawing on theories of cognitive psychologists and usability experts, students will learn to make editorial and design decisions suited to a range of messages, audiences, and purposes. Approaching the practical challenge of editing and design from a problem-solving perspective, students will analyze and apply rhetorical structures, grammatical concepts, and stylistic elements to textual content. Students will follow principles of graphic design to learn how layout, organization, data display (lists, tables, line art, sidebars, diagrams, graphs), illustrations, colour, and typography are used aesthetically and functionally to enhance readability, clarify thought, and reveal underlying logic in professional documents. Students will become familiar with editorial mark-up, document cycling, advanced word processing features, and electronic publishing. Students will also learn techniques to manage the editing process in a production environment with short timelines and frequent deadlines. 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

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
Three Psychology electives		3
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
PS9306	Cognitive and Behavioural Therapy	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
Three Psychology electives		3
(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 Cognitv 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, Research	1
PS8518	Research Design in Child Devel	1
PS8519	Social Cognition	1
PS8520	Socio-Cognitive Development	1
PS8521	Community Psychology	1
PS8522	Directed Readings: Psych Sci	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
PS9101	History of Psychology	1
PS9203	Practicum in Psychological Science III	1
Clinical Psychology		
PS8701	Special Topics in Clinical Psych	1
PS8703	Anxiety Disorders	1
PS8704	Behav Disorders in Children	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 Treatment	1
PS8712	Mood Disorders	1
PS9305	Practicum in Clinical Psych IV	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 students in the clinical psychology Ph.D. program and must be taken over the course of a full year. Prerequisites: Completion of all course requirements in the clinical psychology doctoral program, and approval of the Director of Clinical Training. This is a "Milestone." Pass/Fail

Master's Thesis
Independent research leading to an acceptable master's thesis. This is a "Milestone." Pass/Fail

Comprehensive Requirement
Students will be required to complete a paper designed to provide breadth in their training. 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 provides an overview of basic statistical concepts, applications of these concepts, and an introduction to experimental design and psychology. Topics to be covered include probability theory, significance testing, correlational and regression methods, and an introduction to computerized statistical analysis. 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, and graduate status. 1 Credit

PS8102 Statistics and Research Design II
This course provides instruction in advanced methods in regression and multiple regression, as well as instruction in advanced analysis of variance techniques, general linear models, analysis of categorical data, use of non-parametric statistics, and structural equation modeling. 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, and graduate status. 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, diversity issues in clinical research, etc. This course is required of all MA students in clinical psychology. 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 internal practicum is designed to provide students with breadth in psychological research methods and approaches. Students contribute to a single project that is complimentary to their core area of interest or in multiple smaller projects, spanning multiple labs. Under exceptional circumstances (e.g. infrastructure needs or population opportunities), students may request to conduct the practicum at an external site. This course is required for all MA students in the Psychological Science Field. Pass/Fail. 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, 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 first-year master's students in clinical psychology. 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, couples and family therapies, and group therapy. In addition, non-specific aspects of psychotherapy will be discussed, including the therapeutic relationship, client factors, and therapist factors that contribute to outcome. 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 clinical assessment, psychological testing, and psychological intervention under the close supervision of one or more registered clinical psychologists in a community setting. This course is required of all graduate students in the clinical psychology MA program. The minimum duration is 350 hours. Students are encouraged to apply for practicum placements during their first year from an approved list of supervisors and sites. Prerequisites: Completion of Introduction to Psychological Assessment and Systems of Psychotherapy. 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 will include exposure to both intellectual assessment methods and neuropsychological measures. 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 first-year graduate students in clinical psychology. 1 Credit

PS8310 Psychological Assessment II
This course expands upon issues covered in Psychological Assessment 1, and includes discussion of topics such as clinical interviewing, evidence-based diagnostic assessment, and behavioral assessment. Prerequisites: PS8301 Psychopathology; PS 8309 Psychological Assessment I. This course is required of all MA students in clinical psychology. 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, with the specific topic varying from year to year depending on the instructor and student interests (e.g., perceptual-motor development; theory of mind; youth at risk; life-span development, etc.). 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., psychology and cancer; nutrition and body image; psychology and HIV; psychology of pain, 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., forensic psychology; 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
An overview of the use of neuroimaging in the investigation of complex human cognitive abilities. Content will include 1) a brief review of neuroanatomy, 2) an introduction to the fundamentals, experimental design strategies, and advantages and limitations of current brain imaging techniques (e.g., MRI, PET, ERP, TMS), 3) critical reviews of findings and theories on the relations between the brain, various domains of cognition, and behaviour in current neuroimaging literature. For illustrative purposes, some emphasis will be placed on the use of fMRI to understand normal and abnormal mnemonic processes. 1 Credit

PS8508 Critical Perspectives in Psychology
The focus is on critically evaluating the ways in which psychology as a discipline not only discovers but also shapes and produces knowledge about human behaviour, cognition and emotion. Critical psychologists are centrally interested in the socio-political implications and applications of psychological theory and practice. Drawing on a variety of conceptual frameworks, including feminist theory, post-structuralism, cultural studies, and contemporary psychoanalysis, this course will provide an overview of the wide range of epistemological, methodological and empirical innovations in the study of behaviour and experience. 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 Learning, Plasticity, and 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 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 practicum issues related to the intersection between psychology and the law. The challenges inherent in combining psychology's empirical approach with the legal system's focus on case-rulings and procedure will be explored through discussions of some key areas of psycho-legal research. Such topics may include the role of the jury, expert and ethical issues, risk assessment, fitness to stand trial, criminal investigation techniques, 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

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 process social information and make sense of their social world. Topics will include 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 Socio-Cognitive Development
Discussion of theories and issues in the social and cognitive development of children, particularly those concerning the interplay between social and cognitive development (so-called socio-cognitive development). Broadly construed, socio-cognitive development describes how children's developing cognitive abilities allow them to better understand their social world (e.g. how children come to understand, predict, and explain the behaviour of other people) and how children's social world influences their cognitive development (e.g. how children imitate and learn from others' testimony). 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

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. Training will include strategies for evaluating student progress as well. 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. This course is normally taken during the second, third, or fourth year of graduate study. 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. Prerequisites: 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, 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 organization, 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 anatomical relations among functional systems in an anatomical framework. Content ranges across microscopic and macroscopic levels, as reviewed through readings, lectures, and interactive media. Review of current evidence and methodologies will also include discussions regarding neurodevelopment, neuroevolution, neurodegeneration, neuroplasticity, and neuroimaging, neurological, and neuropsychological techniques. 1 Credit

PS8532 Cognitive Aging
This course provides a comprehensive survey 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 include: life-span theory; research methods in cognitive aging; the aging brain; mild cognitive impairment and dementia; genetics; major cognitive domains (perception, attention and executive function, memory, decision making); affective influences on cognition; education, plasticity, and brain reserve; cognitive effects of lifestyle and exercise. 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 Biopsych
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., stress and biopsychology, sexual and reproductive behaviour, neuroscience, psychoendocrinology, etc.) 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 methods used in the collection, analysis and interpretation of data in psychology. Specific topics will vary from year to year, according to faculty and student interests (e.g., structural equation modelling; latent structure analyses, psychophysiological methods). 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., psychotic disorders; personality assessment; interpersonal psychotherapy, etc.). 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 Behavioural Disorders in Children
This course will be an intensive survey of the literature dealing with social, emotional, and behavioural disorders in children and adolescents. Current theory and research and their implications for clinical practice will be examined. In addition, theoretical and methodological advances related to research on risk and protective factors 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 design approach, information from 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: Introduction to Psychological Assessment. 1 Credit

PS8706 Clinical Psychopharmacology
This course focuses on current practices regarding pharmacotherapy for forms of psychopathology. Following review of essential principles of psychopharmacology, the clinical application of major classes of drugs to treat mental illness will be covered (e.g., anxiolytics, antipsychotics, antidepressants, etc.). The mechanisms of action and scientific evidence, along with historical and philosophical backgrounds, supporting 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 abilities associated with major forms of mental illness. Four broad areas will be discussed: 1) theory, approach, and main findings regarding use of neuropsychological and cognitive-science paradigms in studying psychological disorders; 2) issues and solutions regarding identification of differential cognitive deficits in psychopathology; 3) the interplay of cognition with psychological symptoms and daily functioning; 4) longitudinal factors (premorbid risk, profiles across time). 1 Credit

PS8708 Eating Disorders
An overview of eating disorders including anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified. Topics to be covered include: biological bases of disordered eating; historical trends in prevalence of eating pathology; cognitive disturbances associated with eating disorders; and causes, correlates, and outcomes of eating pathology as well as the complexity and controversy surrounding these conceptualizations. 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 Treatment
Students in this course will be introduced to basic clinical principles of child and adolescent intervention for a variety of disorders and presenting problems, with an emphasis on empirically-supported treatments. Specific interventions comprising these treatments will be examined and discussed as they apply to particular clinical disorders and problems. Special attention will be paid to developmental considerations, race and ethnic diversity, sexual diversity, and other individual differences throughout the course. 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.

PS9101 History of Psychology
An exploration of history of psychology topics, with emphasis on historical perspectives on contemporary topics and links between psychological science and science-based practices of psychology. Students will be exposed to original sources and contemporary critical scholarship that elucidates the temporal and culturally embedded contingencies that shaped the various fields of psychology. The primary objective of this course is to teach students how to use history to critically assess what psychologists do and the knowledge they generate. 1 Credit

PS9201 Professional Issues and Ethics in Psychological Science
An overview of topics related to professional development, including finding a job or post-doctoral 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 the psychology science field. 1 Credit

PS9202 Practicum in Psychological Science II
This internal or external practicum is designed to provide students with additional breadth in research methods. Students lead a research project that is complimentary 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

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. Required for all doctoral students in the clinical psychology field. 1 Credit

PS9303 Practicum in Clinical Psychology II
Practicum training in clinical assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. This course is required of all graduate students in the clinical psychology Ph.D. program. The minimum duration is 350 hours. Students are encouraged to apply for practicum placements from an approved list of supervisors and sites. Prerequisites: Completion of Practicum in Clinical Psychology I. Pass/Fail. 1 Credit

PS9304 Practicum in Clinical Psychology III
Advanced practicum training in clinical assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. This course is required of all graduate students in the clinical psychology Ph.D program. The minimum duration is 350 hours. Prerequisites: Completion of Practicum in Clinical Psychology II. Pass/Fail. 1 Credit

PS9305 Practicum in Clinical Psychology IV
A second advanced practicum training in clinical assessment and intervention under the close supervision of one or more registered clinical psychologists in a community setting. The minimum duration is 350 hours. Prerequisites: Completion of Practicum in Clinical Psychology III. Pass/Fail. 1 Credit

PS9306 Cognitive and Behavioural Therapy
An in-depth course on theory and practice of cognitive and behavioural therapies. Topics covered include exposure-based treatments, cognitive strategies, relaxation-based strategies, mindfulness and acceptance-based strategies, and techniques for enhancing motivation. Prerequisite: Completion of either Systems of Psychotherapy or Treatment of Psychological Disorders. Formerly PS8305. 1 Credit

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 PROJECT Option:		
Master's Research Project		(Milestone)
Two elective credits		2
COURSE Option:		
Four Elective credits		4

ELECTIVES		**Credits**
PA8200	Bureaucracy & Organization	1
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	Public Serv: Diversity & Equity	1
PA8211	Topics in Public Admin	1
PA8212	Directed Studies: Public Admin	1
PA8213	Field Placement	1
PA8214	Topics in Public Policy	1
PA8215	Global Public Governance	1
PA8216	Intrnational Devlpmnt Policy and Politics	1
PA8217	Accountability and Ethics	1
PA8218	Indigenous Law and Pol in Can	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." Pass/Fail

Master's Research Project
The research project option is intended for students following a professional career path in public policy or public administration. In the project, students propose and carry out research or applied work related to an issue or problem they are interested in studying. The project is conducted under the direction of a faculty supervisor and a project supervisory committee. The research project is

submitted in a written report to the faculty supervisor and is evaluated by a project examining committee. This is a "Milestone." Pass/Fail

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 changing nature of Canadian public finance and state-economy relations within the context of globalization. Emphasis will be placed on the shifting role of government in the economy, on the challenges of public financing in an era of fiscal crisis and tax restraint, and on the application of economic models in policy formulation. The role of the state within market society in providing public goods, in particular 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 context in which state budgeting occurs, the role of federalism and global institutions such as NAFTA and 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

PA8200 Bureaucracy and Organization
This course surveys different theoretical approaches to organization and bureaucracy in advanced industrial societies. While this course surveys the major theoretical contributions to the field of organization theory and covers the classics in the public administration literature, it also examines a number of areas about which traditional approaches have been relatively silent, especially organization theories having to do with race, gender and class. It examines the relationships between the processes of bureaucratization, industrial and economic change and the evolution of democracy. A major focus of the course is on the exercise of power, control and accountability in bureaucratic organizations. 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
Decisions affecting Canadian citizens in their daily lives are increasingly being made by a range of different actors and institutions that span global, national, provincial, and local interests. Through the lens of contemporary urban policy issues, this course examines the role of both urban governance and citizenship by addressing a selection of current subjects facing Canadian and selected comparative cities in the contemporary context. The interplay of institutions, interests, and ideas in shaping urban governance will be explored in the following areas of study: 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
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 Field Placement
Field Placements provide a mechanism for students to earn academic credit for relevant work experience (paid or unpaid), normally outside the university. Field Placements must be related to public policy and administration and to the student's learning objectives in the program. Field Placements offer students the opportunity to link theory with practice, to conduct empirical research, to learn about professional practices in organizations in the field of public policy and administration, and to gain appropriate work experience. 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 Public Governance
This course examines global public governance, a loose system within which states and intergovernmental organizations make policy decisions critical to human survival globally. Concepts related to peace and security organizations, international humanitarian and human rights issues, and the international pursuit of economic and financial development will be examined. One critical question is how effective intergovernmental organizations are in terms of policy making and implementation, and why? 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 Accountability and Ethics
This course examines critical challenges in accountability and ethics facing contemporary Canadian governments, how those issues arise, and alternative strategies for responding to those challenges. It looks at the accountability framework within which the public service operates: public service law, management policy, conflict of interest rules, transparency obligations, financial management principles and practices, third party provider governance rules, and Parliamentary oversight. It will also explore the ethical framework governing public servants, ministers and legislators. 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.

SS8000 Statistical Analysis in Social Science Research
See SOCIAL SCIENCE

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

SOCIAL WORK

CURRICULUM

Master of Social Work

DEGREE REQUIREMENTS		Credits
Major Research Paper		(Milestone)
SK8101	Criticl Persp on Marginalizatn	1
SK8102	AOP Respons: Policy, Practice	1
SK8103	Research for Social Change	1
SK8104	Practice Research Seminar	1
SK8105	Field Practicum	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
SK8209	Aboriginal SW Pract and Resrch	1
SK8210	International Social Work	1
SK8211	Directed Studies	1
SK8212	Criticl Persp on Mental Health	1
SK8213	Socially Engaged Media	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

SK8101 Critical Perspectives on Marginalization
This course explores social marginalization, both as a descriptive concept and as a set of multidimensional explanatory processes. The course aims to produce a complex understanding of the various forms that marginalisation has assumed at different times, and of how marginalization has been expressed in relation to particular groups in society. The aim of the course is to develop an analysis which fosters and encourages practical strategies of social work and political interventions. Corequisite SK8102. 1 Credit

SK8102 Anti-oppression Responses to Marginalization
This course, taken concurrently with SK8010, theorizes historical developments and examines contemporary contexts of globalization. A wide range of anti-oppression social work strategies for responding to marginalisation is explored. The course examines the intricate and layered processes of oppression so that each person takes responsible action. Emphasis will be placed on critical analyses of anti oppression theories and practices. Students will also have opportunities to strengthen their self-reflexivity in terms of their own social location and their previous social work practice. Corequisite SK8101. 1 Credit

SK8103 Advanced Research for Social Change
This course is focussed 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.

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 Critcal 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 Regenerating Aboriginal Social Work Practices and Research
This course provides an overview of Aboriginal approaches to social work practices and research. The course draws upon contemporary Aboriginal social work literature to critically reflect on the nature of Aboriginal approaches. The worldview, helping practices and contextual considerations of Aboriginal persons will be considered. 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.

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 Practicum*	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	Practicum*	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 Practicum (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 Practicum
The practicum 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 placement 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 placement experience by the program director and faculty advisor in consultation with the placement host. Pass/Fail. 1 Credit

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	Multcltrl Cities, Planning Pol	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	Multcltrl Cities, Planning Pol	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	Design for Diversity	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

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

Spatial Analysis

SA8907	Health in Urban Environments	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 Multicultural Cities and Planning Policies
Recent immigration patterns have prompted the need to explore how local governments provide urban facilities, services and infrastructures. This course will prepare students on how modern cities of diverse cultures evolve and what policy approaches can sustain them. The course offers a balanced 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, yet the Greater Toronto Area remains the pivot. Anitrequisite IS8934. 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 charette, 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 rigourous 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 Design for Diversity
The course will provide a forum to discuss and analyze issues related to diversity, and, particularly, issues related to inclusive design. Through lectures, examples and seminars, the course will examine diversity issues in design, particularly, the changing roles of the designer in increasingly diverse societies. It will encourage students to respond to questions such as: What are the underlying concepts of diversity that relate to our designed environments? Do we really understand the complexities inherent in these relationships? Is diversity a necessary component of the content, process, and participants in design? What are the consequences of the diversity agenda, particularly in design and planning practice? 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