Offered by the Department of Linguistics in the Faculty of Social Sciences.

Department Head – R.W. Murray

J . . . C . .

Native Languages 205 **H(3-0)**

Native Language I

Primary emphasis on the acquisition of conversational skills and vocabulary. Different Native languages may be offered from time to time.

Note: See the Master Timetable for specific offerings.

Native Languages 207 **H(3-0)**

Native Language II

Continuation of Native Languages 205 with special attention to grammatical structures and written materials.

Prerequisite: Native Languages 205 or equivalent proficiency (in the same language).Sustainability and Human Ecology in the Circumpolar Arctic

The history of northern development and resource management in Canada with emphasis on specific case studies involving sustainability and human ecology in the Circumpolar Arctic.

Northern Planning and Development Studies 500 **F(0-3S)**

Internship Project

An integration of skills learned in previous Northern Planning and Development Studies courses culminating in an individual or group project. The internship will relate to community development issues and to research and development activities in a Canadian or international context.

Prerequisites: Northern Planning and Development Studies 405, 407 and 411.

Instruction offered by members of the Faculty of Nursing.

Note: The University of Calgary Bachelor of Nursing program is presently in a development stage and therefore the University reserves the right to make whatever changes are necessary to the content and the hours of instruction of individual Nursing courses in the program. Some of the Nursing course rackge udandorder to accommodate block scheduling.

Note: Where applicable, Clinical Practice courses must be taken concurrently with the theoretical components.

The following core Nursing courses are for Conjoint Nursing students:

571	574
572	

The following core Nursing courses are for students in the University of Calgary Bachelor of Nursing program.

(*Regular Track students only)

201	307
203	309
205	311
207	401
209	402
211	403
213*	404
301	405
302	406*
303	501
305	502

The following core Nursing courses are for Post Diploma students:

411	531
421	532
441	539
461	542

Nursing 001 **(180 hours)**

Nurse Practitioner Practicum IV

Consolidation of components of NP role in specialty or primary care focus.

Prerequisites: Nursing 645 and 667.

NOT INCLUDED IN GPA

J . . . C . . .

Nursing 201 **H(3-0)**

Introduction to Nursing

Basic concepts of nursing, individual, family, community, health, environment, and the relationships among them. Historical development of the nursing profession, its unique position within the health care system, and the roles of various health care providers.

Corequisites: Nursing 203/205.

Nursing 203 **H(0-3)**

Foundations for Nursing Practice

Development of skills applicable to nursing practice.

Corequisites: Nursing 201/205.

Note: Minimum passing grade is "C."

Nursing 205 **H(3-0)**

Therapeutic Interventions

Nursing therapeutics and pharmacology in wellness and illness states across the lifespan.

Corequisites: Nursing 201/203.

Nursing 207 **H(3-0)**

Nursing Inquiry

Continuing development of a conceptual framework for nursing practice. Development of a theoretical base for understanding various human responses to health experiences.

Prerequisites: Nursing 201/203/205.

Corequisites: Nursing 209/211.

Nursing 209 **H(104 hours)**

Nursing Practice

Continuing development of skills for nursing practice with opportunity to apply assessment, psychomotor and communication skills in the helping relationship.

Prerequisites: Nursing 201/203/205 and current CPR Basic Cardiac Life Support.

Corequisites: Nursing 207/211.

NOT INCLUDED IN GPA

Prerequisites: Nursing 406 and current CPR Basic Cardiac Life Support.

Prerequisite or Corequisite: Nursing 501.

Note: Minimum passing grade is "C."

Nursing 503 **H(39 hours)**

Selected Topics in Nursing

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 511 **H(39 hours)**
(formerly Nursing 503.09)

Introduction to the Use of Music and Sound for the Helping Professions

Survey of recently developed applications of music and sound to integrative health care including traditional music therapy, voice therapy, sonic entrainment, and cross-cultural traditions in the use of music and sound for holistic care.

Prerequisite: Consent of the Faculty.

Nursing 515 **H(3S-0)**

Mind/Body/Integration: Ancient and C ontemporary Healing Practices

Nursing 645 **H(180 hours)**

Nurse Practitioner Practicum III

Opportunity for students to demonstrate proficiency in clinical decision-making and case management where clients have complicated and/or potentially life threatening disorders related to specialty or primary care focus.

Prerequisite: Nursing 643.

NOT INCLUDED IN GPA

Nursing 651 **H(3-0)**

Advanced Study of Biopsychosocial Phenomena: II

Selected health concepts from biophysical and psychosocial perspectives that can be applied across specialty areas of nursing practice.

Prerequisites: Nursing 611/613.

Nursing 653 **H(2S-12)**

Advanced Clinical Practicum II

Clinical laboratory in the student's selected clinical specialty area requiring students to validate perspectives discussed in Nursing 651, to utilize assessment or evaluative instruments related to nursing practice, and to test clinical theories in a practice setting.

Prerequisites: Nursing 611/613.

Prerequisite or Corequisite: Nursing 651.

Nursing 661 **H(3S-0)**

Advanced Pathophysiology and Therapeutics

Advanced pathophysiology and therapeutic processes applicable to and derived from students' areas of practice/population of focus. Learning methods include seminars on selected core topics and individually negotiated investigative activities relevant to students' areas of specialization. Some field work is required.

Prerequisite: Consent of the Faculty.

Nursing 663 **H(3S-1)**
(formerly Nursing 601.26)

Pharmacotherapeutics in Advanced Nursing Practice

Principles of drug action, pharmacokinetics and pharmacotherapeutics in the context of advanced nursing practice. Opportunity to investigate pharmacotherapies specific to student's individual client populations.

Prerequisite: Consent of the Faculty.

Nursing 665 **H(3S-2)**

Advanced Health Assessment

Builds upon fundamental health assessment skills to provide a solid foundation for advanced assessment. Focuses on history taking physical examination, diagnostic reasoning and clinical judgement, as well as selected diagnostic skills necessary for advanced practice.

Prerequisite: Consent of the Faculty.

Nursing 667 **H(3S-0)**

Nurse Practitioner Practice Issues and Role Integration

Systems aspects related to management of complex health problems in NP practice, medical-legal and role development in extended practice environment.

Prerequisite: Consent of the Faculty.

Nursing 671 **H(3S-0)**

Advanced Nursing Practice in Organizational Contexts

Systems aspects related to management of complex health problems or risks, creative approaches to client care and systems use, and examination of factors related to the organizational context of professional practice.

Prerequisites: Nursing 611/613.

Nursing 673 **H(2S-12)**

Advanced Clinical Practicum III

Field practicum in a health care delivery setting requiring students to gather corroborative data regarding theory discussed in Nursing 671, to acquire new skills relevant to advanced practice, and to assess and evaluate role function and role interdependencies.

Prerequisite or Corequisite: Nursing 671.

Nursing 681 **H(3S-0)**

Families and Illness

Facilitates understanding of the reciprocity between illness and family dynamics. Emphasis is on the family dynamics when a family member is experiencing a chronic illness, life-threatening illness or a psychosocial problem.

Prerequisite: Consent of the Faculty.

Nursing 683 **H(3S-0)**

Research Applications: Qualitative Data Analysis

Exploration of research methods based primarily on inductive reasoning. Methodologies, issues and techniques of data collection, analysis and appropriate interpretation will be explored. Use of appropriate hardware and software packages for data reduction is included. Emphasis is placed on congruence between data collection and analysis of data sets. Experience will be provided in data collection, data management and data analysis.

Prerequisite: Nursing 621 or equivalent.

Nursing 685 **H(3S-0)**

Family Research

This interdisciplinary course addresses the conceptual and methodological research issues encountered when the family is the unit of measurement and analysis. The focus will be on critique of research addressing family variables in health care and illness.

Prerequisite: Consent of the Faculty.

Note: A graduate level research methods course is required.

Nursing 687 **H(3S-0)**

Advances in Palliative Care

Facilitates understanding of the physical, emotional, intellectual and spiritual aspects of care required by terminally ill patients and families. Interdisciplinary approach to the critical examination of advances in palliative care and their applications to practice.

Nursing 689 **H(3S-0)**

Mind/Body Integration: Philosophical Foundations

Critical analysis of the integrated nature of mind/body/spirit comparing various cultural paradigms as they relate to health and healing.

Prerequisite: Consent of the Faculty.

Note: Not open to students with credit in Nursing 589.

Nursing 701 **H(3-0)**

Doctoral Special Topics

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 705 **H(3-0)**

Philosophy of Science in Nursing

Exploration of major philosophical positions and their contributions to the generation and evaluation of knowledge. Examination of the development and evolution of nursing knowledge.

Prerequisite: Consent of the Faculty.

Nursing 707 **H(39 hours)**

Directed Study

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Nursing 731 **H(2S-0)**

Doctoral Thesis Seminar

Opportunity for students to discuss their own and other students' research. Before enrolling in this course, students are expected to have identified their area of inquiry.

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

NOT INCLUDED IN GPA

Nursing 769 **H(3-0)**

Contemporary Issues in Health Care

Theoretical examination of concepts and research for increasing the availability and accessibility of health care. Appraisal of the relationships among leadership, policy and practice issues from a multidisciplinary perspective.

Prerequisite: Consent of the Faculty.

Instruction offered by members of the Faculty of Nursing.

Note: The University of Calgary Bachelor of Nursing program at the Medicine Hat College Site is presently in a development stage and therefore the University reserves the right to make whatever changes are necessary to the content and the hours of instruction of individual Nursing Offsite courses in the program.

Note: Where applicable, Clinical Practice courses must be taken concurrently with the theoretical components.

The following Nursing Offsite courses are for students in the BN program at the Medicine Hat College Site:

451	457
452	458
453	551
454	553
455	554

. . . C . .

Nursing Offsite 451 **H(4-0)**

Childbearing and Childrearing Families (Theory)

The study of maternity and child health with family as context; role of nursing pertinent to wellness patterns and alterations in health in these populations.

Corequisite: Nursing Offsite 452.

Nursing Offsite 452 **F(210 hours)**

Childbearing and Childrearing Families (Nursing Practice)

Facilitating and assisting childbearing and childrearing families to deal with needs related to health promotion, health maintenance, and illness intervention in a variety of nursing practice settings.

Corequisite: Nursing Offsite 451.

Note: Minimum passing grade is “C.”

Nursing Offsite 453 **H(4-0)**

Community Focused Nursing (Theory)

Exploration of concepts and models related to the focus of community as client, with emphasis on dimensions of community and population health, health promotion perspectives, team building and partnerships, community assessment, planning and evaluation approaches, and intervention strategies.

Corequisite: Nursing Offsite 454.

Nursing Offsite 454 **F(195 hours)**

Community Focused Nursing (Nursing Practice)

Opportunity to develop skills with the community as the focus of care in a variety of settings.

Corequisite: Nursing Offsite 453.

Note: Minimum passing grade is “C.”

Nursing Offsite 455 **H(3-0)**

Nursing Research

Introduction to quantitative and qualitative research methods appropriate to nursing with an emphasis on the critique of studies for their application to practice.

Note: Completion of a statistics course is strongly recommended prior to taking Nursing Offsite 455.

Nursing Offsite 457 **H(3-0)**

Rural Nursing (Theory)

Issues, theory and research related to the delivery and development of health care in rural areas.

Corequisite: Nursing Offsite 458.

and installation, disaster relief, new product

Petroleum Engineering 511 **H(3-4)**

Design for Oil and Gas Engineering I

Team design project applying principles of project engineering and management to the recovery and processing of hydrocarbons. Petroleum design considerations will include; detailed reservoir characterization; well test analysis; recovery and production forecasting; preliminary drilling, completions and facilities design, and economic evaluation. Team designs will be evaluated through both an oral examination and a major written report.

Prerequisites: Chemical Engineering 315, 405; Chemical Engineering 423 or Petroleum Engineering 423; Petroleum Engineering 523.

Note:

Introductory:

201 275† 279†
249†

History of Philosophy:

301 369 459
303 405 501
305 443 505
343 445 507
355 457 609

Moral Philosophy:

249† 349 549
313† 447 649
329† 449
347 547

Legal Philosophy, and Social and Political Philosophy:

313† 431 525
319 433 553
329† 453 653
353

Metaphysics and Philosophy of Mind:

Philosophy 331 **H(3-0)**

Philosophy of Religion

A philosophical examination of the fundamental concepts of religious thinking.

Prerequisite: Religious Studies 205 or a previous course in Philosophy or consent of the Department.

Philosophy 333 **H(3-0)**

Aesthetics

An examination of the criteria and concepts employed in aesthetic evaluation.

Philosophy 337 **H(3-0)**

Feminist Philosophy

Issues in feminist philosophy and methodology. Topics may include feminist theories of knowledge and science, ethics, metaphysics, political theory and feminist methodology.

Philosophy 343 **H(3-0)**

Plato

A study of the writings of Plato.

Prerequisite: A previous course in the History of Philosophy or consent of the Department.

Philosophy 347 **H(3-0)**

Contemporary Moral Problems

A critical and analytical examination of some current moral issues. Topics to be investigated may include: authority, religion in society, suicide, sexual morality, abortion, the legal enforcement of morality, justice.

Philosophy 349 **H(3-0)**

Contemporary Ethical Theories

A detailed investigation of some central normative ethical theories, including utilitarian, contractarian, and deontological theories.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 355 **H(3-0)**

Hume

A study of the writings of Hume.

Prerequisite: A previous course in the History of Philosophy or consent of the Department.

Philosophy 363 **H(3-0)**

Epistemology

A study of some of the central problems in epistemology, including the following: knowledge and belief, empirical (perceptual and inductive) knowledge, a priori knowledge, appearance and reality, truth, scepticism.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 367 **H(3-0)**

Science and Philosophy

For students in any discipline who would like to understand some of the fundamental principles of scientific enquiry. Topics will include scientific explanation, theory, prediction and confirmation.

Philosophy 369 **H(3-0)**

Nineteenth Century European Philosophy

A study of the major currents in nineteenth-century philosophy. Central figures in this tradition include Fichte, Schelling, Hegel, Feuerbach, Marx, Kierkegaard, Schopenhauer and Nietzsche. The particular works and authors studied will vary from year to year.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 377 **H(3-1T)**

Elementary Formal Logic

Sentential and first-order logic, with identity and descriptions, from both deductive and semantic points of view. Completeness, compactness, decidability for sentential logic.

Note: Not open to students with credit in Philosophy 279.

Philosophy 379 **H(3-0)**

Logic II

Introduction to the metatheory of logical systems. Completeness, compactness, Löwenheim-Skolem, and undecidability theorems for first-order logic. Preview of non-standard models, second-order logic, and Gödel's first incompleteness theorem.

Prerequisite: Philosophy 279 or 377 or consent of the Department.

Philosophy 381 **H(3-0)**

Philosophy of Mind

A study of topics such as: thought, emotions, action and the will, mind-body identity, personal identity, and theories about the nature of mind.

Prerequisite: A previous course in Philosophy or consent of the Department.

Philosophy 399 **H(3-0)**

Topics in Philosophy

A detailed examination of a topic or tradition in European or Anglo-American philosophy. In years when the course is being offered a detailed course outline giving the topic or tradition to be discussed will be available.

MAY BE REPEATED FOR CREDIT

Philosophy 405 **H(3-0)**

Early Modern Authors

A study of the writings of a seventeenth or eighteenth century philosopher other than Hume or Kant. In years when the course is offered a course outline giving the author and aspects of his/her philosophy to be treated will be available from the department office.

Prerequisites: Two previous courses in Philosophy, one of which must be Philosophy 301, 303, or 305; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 407 **H(3-0)**

~~when the course is being offered a det 0 -1.bein ET~~ 46 TD 0.0 RF6 1ittgen, cin, anDavidt t Tw for first-orddetaile(when r

Twentieth Century Analytic Philosophy

A study of the writings of a selecte.9(ARs4Tf 6.2914 0merican plmto1site:)Tj /F27.96 184.

Philosophy 447 **H(3-0)**

Issues in Environmental Ethics

A philosophical examination of selected issues concerning how human beings ought to conduct themselves in relation to other living species and the natural environment. Topics may include: obligations to future generations; animal liberation theories; population policy; pollution; the value of species diversity and species preservation; biocentric and holistic ethical theories of environment; ethical dimension of environmental policy formation.

Prerequisite: One of Philosophy 249, 313, 329, 347, 349 or consent of the Department.

Philosophy 449 **H(3-0)**

Contemporary Meta-Ethics

A study of recent theories about the meaning of moral terms, the nature of moral reasoning, and the relations between facts and values. Theories to be studied will include naturalism, intuitionism, emotivism, prescriptivism, and nihilism.

Prerequisites: Two previous courses in philosophy, at least one of which must be a 300 or higher level course, and one of which must be a moral philosophy course; or consent of the Department.

Philosophy 553 **H(3-0)**

Advanced Political Philosophy

An intensive investigation of one or more issues in political philosophy.

Prerequisites: Two previous courses in Philosophy, one of which must be either 353 or 453, and one of which must be a 400 or higher level course; or consent of the Department.

MAY BE REPEATED FOR CREDIT

Philosophy 565 **H(3-0)**

Philosophical Topics in the Sciences

A study of philosophical issues arising in a particular area of science. Possible topics include philosophy of biology, philosophy of social sciences, and philosophy of physics. Consult Department for specific topic in a given semester.

Note: This course is intended for students who have already done advanced work either in philosophy or in one of the sciences.

MAY BE REPEATED FOR CREDIT

Instruction offered by members of the Faculty of Kinesiology.

Students should also see course listings under the headings Dance Education, Dance Education Activity/Theory, Kinesiology, Outdoor Pursuits, Outdoor Pursuits Activity/Theory, and Physical Education.

J . . . C . .

Physical Education Activity/Theory 219 E(0-2)

Volleyball I

Physical Education Activity/Theory 226 E(0-2)

Strength Training I

Muscular strength and endurance through resistance training.

Physical Education Activity/Theory 228 E(0-2)

Cardiovascular Training I

Physical Education Activity/Theory 229 E(0-2)

Diving I

Prerequisite: Students must be able to swim before taking this course.

Physical Education Activity/Theory 230 E(0-2)

Flexibility and Relaxation I

Prerequisite: Kinesiology 261.

Physical Education Activity/Theory 263 E(0-2)

Alpine Skiing I

. . . C . .

Physical Education Activity/Theory 319 E(0-2)

Volleyball II

Prerequisite: Physical Education Activity/Theory 219.

Physical Education Activity/Theory 329 E(0-2)

Diving II

Prerequisite: Physical Education Activity/Theory 229.

Physical Education Activity/Theory 363 Q(0-4)

Alpine Skiing II

Prerequisite: Physical Education Activity/Theory 263.

Physical Education Activity/Theory 501 E(0-2)

Special Topics in Physical Activity

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Physical Education Activity/Theory 503 Q(0-4)

Special Topics in Physical Activity

Prerequisite: Consent of the Faculty.

MAY BE REPEATED FOR CREDIT

Instruction offered by members of the Department of Physics and Astronomy in the Faculty of Science.

Department Head – R. B. Hicks

Note: For listings of related courses, see Applied Physics, Astronomy, Astrophysics, Medical Physics and Space Physics.

Students intending to register in any Physics course should read the relevant Faculty of Science Program section of this Calendar.

Some Physics courses offered during First Year and the first session of Second Year are composed of modules (M1 to M13 and L1 to L4, listed below); see course listings for Physics 211, 219, 221, 223, 259, 269, 319, 321, 323 below.

Modules for First Year and First Session Second Year Physics Courses

M1 Motion and Kinematics. Motion in one dimension, including displacement, velocity and acceleration; relative motion; graphical analysis of motion.

M2 Forces and Acceleration. Newton's laws of motion; vectors; statics with forces; vector kinematics; uniform circular motion and other curvilinear motion; non-inertial reference frames.

M3 Energy, Momentum and Torques. Work and energy; gravitational energy; conservation of mechanical energy; friction; systems of particles and momentum conservation; statics involving torques.

M4 Electric Forces and Circuits. Electric force, field, potential energy, potential, and potential gradient. Current, electromotive force, Ohm's law, meters, DC circuits, Kirchhoff's rules.

M5 Magnetic Forces. Magnetic field, force on a moving charge, flux, Faraday's law, Lenz's law; applications; magnetic force on a current; magnetic field of a current; magnetic materials; applications.

M6 Thermal Physics. Gas laws; kinetic theory of gases; temperature; internal energy; specific heat; energy transfer; laws of thermodynamics; PVT diagrams.

M7 Basic Optics. Reflection, refraction; real and virtual images; images as objects; mirrors; lenses; optical instruments; wave nature of light; interference.

M8 Harmonic Motion. Simple harmonic motion (SHM) and its representation using complex numbers; physical examples; superposition; differential equation for SHM and its solution; damped and forced harmonic oscillators; physical examples.

M9 Waves I. Equations for travelling and standing waves; waves in gases, fluids, solids, and on strings; acoustic waves; superposition; wave speed; intensity and intensity level; Doppler shift for sound waves; energy transfer by radiation.

M10 Waves II. Wave equation and its harmonic solutions; waves in gases, fluids, solids, and on strings; acoustic waves; superposition; group and phase velocity; energy transport by waves; reflection and transmission; complex impedance; normal modes.

M12 Rotational Motion. Rotational kinematics and dynamics; linear dynamics; applications of the centre-of-rt by wavUracme ofd o-5714 0 TDss0olution;

Physics 026 **E(12 hours)**

Module L4 Physics Laboratory IV

Prerequisite: Consent of the Department.

NOT INCLUDED IN GPA

Physics 030 **Q(16 hours)**

Data Analysis I

Acquisition and analysis of experimental data; computational techniques.

Prerequisite: Physics 315 or 323 or 355.

NOT INCLUDED IN GPA

Physics 031 **Q(16 hours)**

Data Analysis II

Continuation of Physics 030.

Prerequisite: Physics 030.

NOT INCLUDED IN GPA

Physics 041 **Q(16 hours)**

Computers in Physics II: Document Preparation

Preparation of reports, papers, and other documents using Tex and LaTex.

Prerequisite: Physics 315 or 323 or 355.

NOT INCLUDED IN GPA

J C

Physics 211 **H(4-2T)**

Mechanics

Modules M1, M2 and M3.

Prerequisite: Pure Mathematics 30 or Mathematics 30.

Note: Physics 30 is recommended as preparation for Physics 211.

Note: Credit for both Physics 211 and any of 205, 217, 221 or 231 will not be allowed.

Note: Not open to students with 70% or higher in Physics 30 and Pure Mathematics 30 (or Mathematics 30) and 60% or higher in Mathematics 31, except with special Departmental permission.

Note: Physics 211 and 221 differ in their prerequisites, but cover the same material and have the same examinations and tutorial quizzes. Physics 211 has an extra lecture hour per week to deal with certain topics from High School Physics and Mathematics 31.

Physics 221 **H(3-2T)**

Mechanics

Modules M1, M2 and M3.

Prerequisite: A grade of 70% or higher in Physics 30, 50% or higher in Mathematics 31, and 70% or higher in Pure Mathematics 30 or Mathematics 30.

Note: Credit for both Physics 221 and any of 205, 211, 217 or 231 will not be allowed.

Physics 223 **H(3-3)**

Introductory Electromagnetism, and Thermal Physics

Modules M4, M5, M6 and L1. Intended for students intending to major in BioSciences, Chemistry, Geology, or Geophysics.

Prerequisite: Physics 211 or 217 or 221.

Note: Credit for both Physics 223 and any of 207, 213 or 355 will not be allowed.

Physics 225 **H(3-1T-3**

Classical Physics

Rotational mechanics; simple harmonic motion; waves; fluids.

Prerequisites: Physics 211 or 217 or 221; Applied Mathematics 217 or Mathematics 249 or 251 or 261.

Note: Credit for both Physics 225 and any of Physics 321 or Modules M8, M10 or M12 will not be allowed.

Note: For students intending to major in Physics, Applied Physics, Astrophysics, or Chemical Physics.

Physics 259 **H(3-IT-3/2)**

Electricity and Magnetism (for students in Engineering)

Modules M4, M5, M13 and L4b. Electric charges and electric current; Ohm's Law, Kirchhoff's Laws, application to simple circuits; potential and capacitance. An introduction to electromagnetic induction; inductance; electromotive force; electrical properties of materials.

Prerequisite: Engineering 205.

Prerequisite or Corequisite: Applied Mathematics 219.

C

Physics 301 **H(3-3)**

Modern Physics I

Relativistic kinematics; spacetime diagrams; relativistic energy and momentum conservation with applications to particle physics. Nuclear radiation and exponential decay. Probabilistic aspects of nuclear processes. Planck's blackbody radiation law. Elementary particle physics.

Prerequisites: Physics 211 or 221; 213 or 223; Mathematics 221 or 211.

Physics 319 **H(3-3T) or H(2-2T-3) or H(1-1T-6)**

Directed Study in Physics II

Three modules, subject to prerequisites and availability. At least one module must be from Modules M8, M10, M12 and M13.

Prerequisite: Consent of the Department.

Physics 321 **H(3-3T)**

Harmonic Motion,Waves, and Rotation

Modules M8, M10 and M12.

Prerequisites: Physics 211 or 217 or 221; Mathematics 221 or 211; and 253 or Applied Mathematics 219.

Note: Credit for both Physics 321 and any of Physics 225 or 311 or 313 or 317 or 363 will not be allowed.

Physics 323 **H(2-2T-3)**

Optics and Electromagnetism

Modules M7, M13 and L2.

Prerequisites: Physics 211 or 221, and 213 or 223; Applied Mathematics 217 or Mathematics 249 or 251 or 261.

Corequisite: Mathematics 253 or 263.

Note: Credit for both Physics 323 and any of Physics 209 or 311 or 313 or 355 will not be allowed.

Physics 325 **H(3-3)**

Modern Physics II

Origins of quantum mechanics, a historical perspective. Concepts of wave mechanics and applications: atoms, molecules, and solids. Kinetic theory of gases; distribution functions; statistics of quantum gases with applications.

Prerequisites: One of: (a) Physics 311, 313 and 315, (b) Physics 321 and 323, or (c) Physics 341, 355.

Note: Credit for both Physics 209 and 325 will not be allowed.

Physics 341 **H(3-1)**

Classical Mechanics I

Forced and damped harmonic oscillations with real and complex numbers; anharmonic oscillators; central force motion and scattering; non-inertial frames; 2- and 3-body problems; applications of linear differential equations and complex numbers.

Prerequisites: Physics 225 or 321; Mathematics 211 or 221; .

Prerequisite or Corequisite: Applied Mathematics 307 or Mathematics 253 or 263.

Physics 343 **H(3-0)**

Classical Mechanics II

Rotating frames of reference; general rotations of rigid bodies; moment of inertia tensor; eigenvalues and eigenvectors; Lagrangian and Hamiltonian mechanics; potential theory and tides; perturbation theory.

Prerequisites: Physics 341; Applied Mathematics 307 or Mathematics 253 or 263.

Physics 347 **H(3-0)**
(formerly Physics 447)

Thermodynamics

Laws of thermodynamics, absolute temperature, entropy, thermodynamic potentials, applications.

Prerequisites or Corequisites: Physics 217 or 223 or 315 or 325; Applied Mathematics 307 or 311 or Mathematics 349 or 351.

Note: Credit for both Physics 347 and Chemistry 371 will not be allowed.

Physics 355 **H(3-3)**

Electromagnetic Theory I

Electrostatics, DC circuits, calculation of magnetic intensity from currents, motion of charged particles in electric and magnetic fields, electromagnetic induction, transient effects in capacitors and inductors, electric and magnetic properties of materials.

Prerequisites: Physics 211 or 221; Applied Mathematics 219 or Mathematics253.

Note: Credit for both Physics 355 and 323 will not be allowed.

Physics 369 **H(3-3/2)**

Acoustics, Optics and Radiation (for students

Physics 443 **H(3-0)**

Quantum Mechanics I

Basic postulates of quantum mechanics. Mathematical formalism of the theory and its physical interpretation. Schrödinger's time-dependent and time-independent equations. Single particle in a potential field (square well, potential barrier, harmonic oscillator, Kronig-Penney, Coulomb) and rigid rotator. The applicability of these potentials to atomic, molecular, nuclear, and solid state physics will be indicated.

Prerequisites: Physics 325; 343 or 433.

Note: Credit for both Physics 443 and Chemistry 373 will not be allowed.

Physics 449 **H(3-0)**

Statistical Mechanics

An introduction to statistical mechanics with applications.

Prerequisite: Physics 347 or 447.

Physics 455 **H(3-0)**

Electromagnetic Theory II

Macroscopic Maxwell equations. Scalar and vector potentials. Energy and momentum in Maxwell's theory. Electrostatics and magnetostatics. Dielectric and magnetic properties of materials. Superconductors.

Prerequisites: Physics 313 or 323 or 355; Applied Mathematics 309 or Mathematics 353.

Prerequisite or Corequisite: Applied Mathematics 413.

Physics 457 **H(3-0)**
(formerly Physics 555)

Electromagnetic Theory III

Electromagnetic wave solutions to Maxwell_s equations, in vacuum and in insulating and conducting media. Waveguides. Electromagnetic radiation from accelerated charges. Relativistic formulation of electrodynamics.

Prerequisites: Physics 455; Applied Mathematics 413.

Physics 471 **H(3-3)**

Optics

Geometrical Optics: lenses, mirrors, and other basic optical components. Matrix Methods. Physical Optics: Interference, Diffraction, and Polarization. Fourier Optics. Modern Optics: Lasers and Fibre Optics.

Prerequisites: Physics 325, 455; Applied Mathematics 413.

Physics 491 **Q(1S-0)**

Undergraduate Seminar I

Attendance at weekly seminars and presentation of one seminar on current physics-related research areas based on literature research, plus a written report.

Prerequisites: Physics 325, 343, 455.

Physics 499 **H(1-3T)**

Problem-Solving in Physics

Solving problems that require methods from more than one area of physics. Problems may include physics of lasers, atoms and molecules, plasmas, rocket flight, fluids, and special relativity.

Prerequisites: Physics 343, 455, 449.

Prerequisite or Corequisite: Physics 443.

Physics 501 **H(3-0)**

The Theory of Relativity

Review of relativistic kinematics and its geometrical interpretation. Applications of relativistic kinematics. Four-vector formalism and tensors in Minkowski space with applications. Introduction to Riemannian geometry and tensors in curved spacetime. Einstein equation. Schwarzschild metric and applications.

Prerequisites: Physics 301 and one of Mathematics 353 or Applied Mathematics 309.

Physics 507 **H(3-0)**

Solid State Physics

Crystal structure. Classification of solids and their bonding. Fermi surface. Elastic, electric and magnetic properties of solids.

Prerequisites: Physics 443 or Chemistry 373; Physics 449, 455.

Physics 509 **H(3-0)**

Plasma Physics

Occurrence of plasmas in nature, single particle motion, plasmas as fluids, waves in plasmas, diffusion, resistivity, equilibrium and stability, kinetic theory of plasmas, non-linear effects.

Prerequisites: Physics 343 or 433; 455.

Physics 533 **H(3-0)**

Advanced Mathematical Methods of Physics

Hilbert space. Complete orthonormal sets of functions. Sturm-Liouville theory. Green functions. Integral equations.

Prerequisites: Physics 443 or Chemistry 373; Physics 455.

Physics 535 **H(3-3)**

Computational Methods in Physics

Solution of problems associated with the analysis of physical systems, using digital computers, high level programming languages, and mathematical computation systems (e.g., Maple, Macsyma).

Prerequisites: Physics 443 or Chemistry 373 and Physics 455. **Note:** A knowledge of a high level programming language (C, C++, Fortran or Pascal) is highly recommended.

Physics 543 **H(3-0)**

Quantum Mechanics II

Theory of angular momentum and applications, perturbation theory and applications. Identical particles. Introduction to relativistic wave equations.

Prerequisite: Physics 443 or Chemistry 373.

Physics 561 **H(2-1)**

Stable and Radioactive Isotope Studies, Fundamentals

A multidisciplinary course. Topics include nucleosynthesis, radioactive decay, isotope exchange phenomena, kinetic isotope effects, tracer techniques, molecular spectra and instrumentation.

Prerequisite: Consent of the Department.

Physics 571 **H(3-0)**

Laser Physics

Theoretical aspects of lasing and lasers. Principles of operation of solid-state, liquid, and gas lasers. Applications of laser systems to research, medical, and industrial projects.

Prerequisites: Physics 443, 455.

Note: Physics 449 is suggested but not required.

Physics 591 **Q(1S-0)**

Undergraduate Seminar II

Similar to Physics 491, but including literature research into the connection between, influence on, or role of Physics in other areas of academia or society.

Prerequisite: Physics 491.

Physics 597 **H(1-6)**
(formerly Physics 409)

Senior Laboratory

Selected advanced experiments. Where possible, students may choose those experiments most suited to their interests.

Prerequisites: Physics 325; Physics 355; and Applied Physics 407 or 507.

Physics 598 **F(0-6)**

Research in Physics

Research project in Physics.

Prerequisites: Physics 443, 449, 455 and consent of the Department.

Physics 599 **H(0-9)**

Independent Study

Each student will be assigned a project in consultation with a tutor. A written report and oral presentation are required.

Prerequisite: Consent of the Department.

Note: This course may be repeated once for credit.

G C

Only where appropriate to a student's program may graduate credit be received for courses numbered 500-599.

Physics 603 **H(3-0)**

Experimental Methods of Physics

Instrumentation for physical experiments. General philosophy of experimentation; signal processes; signal processing methods; instrument design and control; data acquisition and storage; specific detection methods.

Physics 605 **H(3-0)**

Advanced Data Analysis

Methods of extraction of significant information from experimental data degraded by noise. Parametric and non-parametric statistical methods; curve fitting; spectral analysis; filtering, sampling, convolution and deconvolution techniques.

Physics 609 **H(3-0)**

Advanced Classical Mechanics

Variational principles, Lagrange's equations, Noether's theorem. Hamilton's equations and

canonical transformations. Hamilton-Jacobi theory, action-angle variables. Perturbation theory.

Note: It is expected that a student's background will

Political Science 325 **H(3-0)**

Federalism

Theoretical and empirical examination of federalism in Canada and other selected states.

Prerequisite: Political Science 321.

Political Science 327 **H(3-0)**

Feminist Political Theory

Examination of feminist political theories and ethical issues in gender politics.

Political Science 329 **H(3-0)**

Alberta and Provincial Politics

Alberta politics in the comparative context of Canadian provincial politics.

Political Science 343 **H(3-1T)**

Law, Politics, and the Judicial Process

The judicial system as a branch of government and as part of the political process. Focus on the Canadian judiciary within a comparative context.

Political Science 357 **H(3-0)**

Introduction to Public Policy Analysis

An introduction to themes and methods in public policy studies. The practical and normative problems facing governments in initiating, formulating, enacting, and implementing policy will be discussed. Case studies will be employed.

Prerequisite: Political Science 223 or 225 or 321; or consent of the Department.

Political Science 359 **H(3-0)**

Comparative Government and Politics

An introduction to the analytical concepts of the comparative approach to political analysis.

Note: The Department recommends this course precede Senior Courses taken in the field of Comparative Government.

Political Science 361 **H(3-0)**

Governments and Politics of Eastern Europe

Post-communist politics in eastern Europe, including the Baltic states and Ukraine. Concentration on transitions to democracy and relations with the European Union.

Political Science 363 **H(3-0)**

Governments and Politics of Western Europe

An introduction to the governments and politics of the states and societies of western Europe including the importance of their membership in the European Union.

Political Science 365 **H(3-0)**

Government and Politics of China

Politics of China in its social, economic, and ideological environment.

Political Science 369 **H(3-0)**

Governments and Politics of the Middle East

A survey and analysis of the organization and functioning of governments and politics of the contemporary Middle East, with emphasis on the social and economic environments which influence them.

Political Science 371 **H(3-0)**

Governments and Politics of Africa

Political institutions of selected African states. The influence of class and tribal structure; political parties; elections, the source and nature of ideologies; and economic and social policies.

Political Science 375 **H(3-0)**

Government and Politics of Russia

The collapse of the U.S.S.R. and Russia_s constitution, power struggles, elections, democracy, and marketization.

Political Science 377 **H(3-0)**

Government and Politics of the United States

A study of the institutions and processes of American politics.

Political Science 381 **H(3-0)**

Introduction to International Relations

The structures and processes of international relations and foreign policy.

Political Science 383 **H(3-0)**

Introduction to International Law

The basic concepts, principles, and functions of international law.

Prerequisite: Political Science 381 or consent of the department.

Political Science 385 **H(3-0)**

Introduction to International Organizations

An introductory analysis of international governmental organizations with main emphasis on the United Nations and selected regional organizations.

Prerequisite: Political Science 381 or consent of the department.

Political Science 387 **H(3-0)**
(Historical Studies 387)

Political History of Ireland from 1603

A study of modern Ireland from the English conquest of 1603 to the present. It will include a special emphasis on the origins of the contemporary Irish Republic and Northern Ireland.

Political Science 389 **H(3-0)**
(Historical Studies 389)

Government and Politics of Japan Since 1850

Political development of modern and contemporary Japan, and Japan's diplomatic relations with its Asia-Pacific neighbours.

Note: Not open to students with credit in Political Science 367.

Political Science 391 **H(3-0)**
(Historical Studies 391)

Modern Latin American Politics and Society

A political history of modern and contemporary Latin America. Themes may include populism, revolution, militarism, new social movements, and democratization.

Note: Not open to students with credit in Political Science 373.

Political Science 399 **H(3-1T)**

Research Methods

Research design, measurement, data collection, and data analysis.

Prerequisite: One half course at the 200 level in Political Science or consent of the Department.

Note: Credit towards degree requirements will be given for only one of Anthropology 307, Applied Psychology 301/303, Engineering 319, Political Science 399, Psychology 312, Sociology 311/315, Statistics 201/211, 213/217, 333, 357; that one being a course appropriate to the degree program.

All courses numbered 401-597 inclusive are generally offered in alternate years. Please consult the master timetable.

Political Science 401 **H(3-0)**

Property and Justice

Ethical reflections on theories of property in their political context. Focus on Augustine, Aquinas and contemporary Christian views.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 405 **H(3-0)**

Biopolitics

Biological and cultural origins of political behaviour. Topics such as altruism, reciprocity, sex differences, aggression, and emergence of the state.

Political Science 407 **H(3-0)**

Classical Political Thought

An examination of selected classical texts from historians, dramatists and political philosophers with special focus upon the concepts relevant to political problems in the twentieth century.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 409 **H(3-0)**

Liberalism and Conservatism

Liberal and conservative writers such as J.S. Mill and Edmund Burke. Contemporary developments in neoliberalism and neoconservatism.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 411 **H(3-0)**

Recent Political Thought

A study of selected twentieth-century political thinkers and their critics. Consult the department for information on the selection of topics.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 413 **H(3-0)**

Politics and Literature

Political analysis of how selected works of literature articulate visions of order and disorder.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 423 **H(3-0)**

Politics of the Canadian North

The evolution of government and politics in Canada's Territories.

Political Science 500 **F(3-0)**

Honours Thesis

For students in the last year of their Honours program.

Political Science 501 **H(3-0)**

Independent Research

Fourth-year Political Science Majors will select research topics in one of the following fields: political theory; Canadian politics; comparative politics; international relations; public policy, law, and administration.

Prerequisite: Consult the Department for assignment to a faculty supervisor.

Note: Not open to students with credit in Political Science 500.

Political Science 503 **H(3-0)**

Selected Topics in Political Theory

Content of the course will vary from year to year. Consult the Department for information on choice of topics.

Prerequisite: Political Science 310 or consent of the Department.

Political Science 521 **H(3S-0)**

Canadian Executive Federalism

Preparation for and participation in a model First Ministers' Conference.

Prerequisite: Consent of the Department.

Political Science 541 **H(3-0)**

Selected Topics in Public Law

An examination of the political, philosophical, and institutional dimensions of selected public law issues. Civil liberties issues will be emphasized, but other questions may also be studied. Consult the Department for information on choice of topics.

Prerequisite: Political Science 343 or 442.

Political Science 551 **H(3-0)**

Political Science 675 **H(3-0)**

Selected Topics in Advanced Comparative Politics

675.01. Middle East

675.02. Africa

675.03. East Asia

675.04. Latin America

675.05. Western Europe

675.06. Eastern Europe and the Former Soviet Union

675.07. Public Policy

675.08. Politics of Development

Political Science 681 **H(3-0)**

Advanced Analysis of International Relations

Selected issues and approaches in the analysis of world politics.

Political Science 683 **H(3-0)**

Advanced Studies in Foreign Policy

Selected themes in the formation and implementation of foreign policies.

Political Science 685 **H(3-0)**

Strategic Studies

Advanced seminar in major topics in strategic studies, such as arms control, deterrence, and other military doctrines.

Psychology 443 **H(3-0)(Area II)**

Interpersonal Relationships

Application of social psychological theory and methodology to a variety of topics in the area of interpersonal relationships such as attraction, close relationships, interpersonal conflict, communication, and power. Course projects will be an integral part of the course.

Prerequisites: Psychology 312 and 345.

Note: Sociology 341 does not substitute for Psychology 345 as a prerequisite.

Psychology 447 **H(3-0)(Area II)**

Advanced Topics in Personality or Social Psychology

An examination of current research topics in personality or social psychology or gender.

Prerequisites: Psychology 205 and appropriate 300-level course. Students are advised to consult with the Department regarding specific prerequisites for the course in a given year.

Note: May be repeated once for credit with consent of the Department.

Psychology 449 **H(3-2)(Area II)**
(formerly Psychology 453)

Experimental Child Psychology: Social-Personality Development

Socialization processes and behaviours from birth to adolescence; observational learning, altruism, moral development, sex-roles, dependency, emotional development, and social motivation.

Prerequisites: Psychology 312 and one of 351 or 355.

Psychology 451 **H(3-1)(Area III)**

Experimental Child Psychology: Basic Processes

Neonatal, infant, and child behaviour drawn from the laboratory and experimental research; sensory and basic learning processes and perceptual-cognitive development.

Prerequisites: Psychology 312 and 351.

Psychology 455 **H(3-0)(Area III)**

Sensory, Perceptual, and Cognitive Aspects of Aging

Basic research and contemporary issues in the age-related changes in sensation, perception, attention, learning and memory, intelligence and problem-solving.

Prerequisites: Psychology 312 and 353.

Note: Not open to students with credit in Psychology 553.

Psychology 457 **H(3-0)(Area II)**

Social and Clinical Aspects of Aging

Stability and change in the later years of life with a focus on social and clinical areas of aging.

Prerequisites: Psychology 312 and 353.

Note: Not open to students with credit in Psychology 553.

Psychology 459 **H(3-0)(Area II)**
(formerly Psychology 559)

Developmental Psychopathology

A critical examination of developmental psychopathology during childhood and adolescence with an emphasis on the characteristics of the disorders, their determinants, and outcomes. Current theories and research, and recent trends in intervention and prevention will be emphasized.

Prerequisite: Psychology 359.

Psychology 461 **H(3-2)(Area III)**

Learning: Theory and Research

Traditional and contemporary learning theory emphasizing infrahuman data.

Prerequisite: Psychology 312.

Psychology 463 **H(3-2)(Area III)**

Memory

Current and classic memory research is explored. Topics include how memories are encoded, stored, and retrieved. Laboratory projects introduce methodologies used in memory research.

Prerequisites: Psychology 312 and 365.

Psychology 465 **H(3-2)(Area III)**

Research in Cognitive Psychology

Current research in human memory, thinking, attention, and language processing is explored. Laboratory projects will introduce research methodologies used in these areas.

Prerequisites: Psychology 312 and 365.

Psychology 467 **H(3-2)(Area III)**

Experimental Psycholinguistics

Exploration of the cognitive, neuropsychological, and social processes that underlie language abilities. A laboratory component provides experience with methodologies used to study language behaviour.

Prerequisite: Psychology 312.

Psychology 469 **H(3-2)(Area III)**

Visual Perception

A systematic examination of vision and its role in our interactions with the natural environment. Topics may include: the physics of light; optics; eye and retina; visual pathways and visual brain; perception of color, space, change and motion; visual development and aging; art and vision; visual disorders; and recovery from blindness.

Prerequisites: Psychology 312 and 369.

Psychology 471 **H(3-2/2)(Area III)**

Auditory Processing

Basic acoustics, anatomy, and physiology of the auditory system, psychoaccoustics (sensitivity to various aspects of sound), speech perception, and effects of noise on hearing.

Prerequisites: Psychology 312 and 369.

Psychology 473 **H(3-0) (Area III)**

Advanced Evolutionary Psychology

Human behaviour as illuminated by comparative research in animals. An evolutionary approach dealing with the human mind as a set of information programs.

Prerequisites: Psychology 312 and 377.

Psychology 475 **H(3-0)(Area III)**

Behavioural Pharmacology

The behavioural effects of drugs specifically employed to affect the nervous system, as seen in the treatment of mental disorders, behavioural disorders, and other conditions such as Parkinson's, Huntington's and Alzheimer's diseases. Neuropharmacologic agents will be discussed as they relate to the biochemistry and physiology of putative neurotransmitters.

Prerequisite: Psychology 371 or 375.

Psychology 476 **F(3-3)(Area III)**

Physiological Psychology

Physiological bases of sensory, perceptual, motivational, emotional, learning, and motor processes. The functioning of the nervous system in these processes is emphasized.

Prerequisite: Psychology 371 or 375.

Psychology 479 **H(3-2)(Area III)**

Human Neuropsychology

Integration of the literature on human brain damage with the evidence from animal research. Topics include developmental neuropsychology; cognitive deficits associated with frontal, parietooccipital, and temporal lobes; origins and mechanisms in the determination of cerebral dominancy; disorders of learning and memory; long-term effects of cerebral lesions.

Prerequisite: One of Psychology 371 or 375.

Psychology 489 **H(3-3T)(Area II)**

The Psychology of Creativity

Personality characteristics of creative people, and the psychological experiences they report while working. Theoretical accounts of creativity provided by psychologists will be particularly emphasized. Tutorials will include feature films that dramatize lecture topics.

Prerequisite: Psychology 205.

Note: Psychology 209 is recommended as a preparation for this course.

Psychology 491 **H(3-0)(Area III)**

Cross-Cultural Cognition

Theory and research on the interaction of culture and human cognition. Topics include cross-cultural research in perception, language processing, memory, concepts, and reasoning.

Prerequisite: Psychology 365.

Psychology 497 **H(3-0)(Area III)**

Consciousness

An exploration of the origin, nature, and function of consciousness as informed by research on conscious and unconscious processes, psychological disorders, neuropsychological case studies, consciousness-altering drugs, hypnosis, meditation, state-dependent memory, sleep, and dreams.

Prerequisites: Psychology 312 and 365.

Psychology 501 **H(3S-0)(Area II)**

Special Topics Seminar

Selected topics from one or more of the following areas in psychology: aging, clinical, developmental, industrial, organizational, personality, social, history, and theory.

Prerequisites: Psychology 312 and consent of the Department.

Note: May be repeated once for credit with the consent of the Department. Students should consult the Department concerning topics and recommended preparation for a given session.

Prerequisite: Consent of the Department.

Psychology 699 **H(0-3)**

Research Course in Psychology

Offered under various subtitles. Consult the Department for details.

Prerequisite: Consent of the Department

Note: May be repeated for credit with the consent of the Department.

Psychology 701 **H(3S-0)**

Graduate Teaching Seminar

This seminar aims to foster the development of graduate student instruction/presentation skills. Topics covered include the development of new courses, lecturing, leading discussion, motivating students, computer-assisted instruction, development of A-V materials, the use of instructional technology, examination and grade management, marking, and ethical/protocol/misconduct issues in the classroom. Students will also be provided with teaching experience and feedback in a supportive environment.

Psychology 705 **H(3-0)**

Seminar in History/Systems/Theoretical Psychology

Selected topics in the history of twentieth-century psychology and the theoretical problems of modern psychology.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 706 **F(0-3)**

Research in History/Systems/Theoretical Psychology

Advanced research in recent developments in theory, methodology and foundational issues and/or the development of historiography in the discipline.

Prerequisite: Consent of the Department.

Psychology 721 **H(3-0)**

Seminar in Sensation and Perception

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 722 **F(0-3)**

Research in Sensation and Perception

Advanced project on a contemporary research issue in vision and/or audition. Specific project will vary with student and supervisor interest as well as available research facilities, possible research areas include spatiotemporal aspects of sight or hearing, speech perception, visual attention, and age-related changes in these functions.

Prerequisite: Consent of the Department.

Psychology 723 **H(3-0)**

Seminar in Cognition

Selected topics in cognitive psychological theory and research.

Prerequisite: Consent of the Department.

MAY BE REPEATED FOR CREDIT

Psychology 724 **F(0-3)**

Research in Cognition

Empirical research in cognitive psychology conducted under the supervision of a faculty member.

Prerequisite: Consent of the Department.

Supervised training experience in an approved clinical setting. Provides in-depth exposure to specific clinical populations and to the application of various psychological assessment and intervention strategies and techniques.

Note: Open only to students enrolled in the Clinical Psychology program.

Note: This course is offered in the Fall Session and would normally be taken in the third year. Potential honours students are urged to consider taking this course in second year. Please consult the appropriate Division Chair.

Pure Mathematics 445 **H(3-1T)**

Analysis II

Series; sequences and series of functions, uniform convergence; basic topology in Euclidean spaces; analysis with functions of several variables; implicit and inverse function theorems.

Prerequisites: Mathematics 353 and Pure Mathematics 435, or consent of the Division.

Corequisite: Mathematics 311.

Pure Mathematics 471 **H(3-0)**

Discrete Optimization

Block designs and extremal set theory, efficiency of algorithms, complexity theory, trees and sorting, graphs and transversals of families of sets, networks and the max-flow min-cut theorem, dynamic programming, recursion.

Prerequisite: Pure Mathematics 371.

Pure Mathematics 501 **H(3-0)**

Integration Theory

Abstract measure theory, basic integration theorems, Fubini's theorem, Radon-Nikodym theorem, further topics.

Prerequisite: Pure Mathematics 545 or consent of the Division.

Note: Credit for both Pure Mathematics 501 and 601 will not be allowed.

Pure Mathematics 503 **H(3-0)**

Topics in Pure Mathematics

This course is offered under various subtitles. Consult Department for details.

Prerequisite: Consent of the Division.

MAY BE REPEATED FOR CREDIT

Pure Mathematics 505 **H(3-0)**

Topology I

Metric spaces. Introduction to general topology.

Prerequisite: Pure Mathematics 435 or consent of the Division.

Pure Mathematics 511 **H(3-0)**

Rings and Modules

Ring theory, and structure of modules. Application to Abelian groups and linear algebra. Additional topics.

Prerequisite: One of Pure Mathematics 431, Applied Mathematics 441; or consent of the Division.

Pure Mathematics 519 **H(3-0)**

Information Theory, Codes, and Cryptography

A continuation of Pure Mathematics 419. Topics include: Entropy, Shannon's Theorem, Hamming codes, Reed-Muller codes, Reed-Solomon codes, M.D.S. codes and finite geometries, Ergodic and Markov processes.

Prerequisites: Mathematics 311, Pure Mathematics 371 and 419.

Pure Mathematics 521 **H(3-0)**

Complex Analysis

A rigorous study of functions of a single complex variable. Consequences of differentiability. Proof of the Cauchy integral theorem, applications.

Prerequisite: Pure Mathematics 435 or consent of the Division.

Note: Credit for both Pure Mathematics 521 and 421 will not be allowed.

Pure Mathematics 529 **H(3-0)**

Advanced Cryptography and Cryptanalysis

Probability and perfect secrecy. Provably secure cryptosystems. Prime generation and primality testing. Cryptanalysis of factoring-based cryptosystems. Discrete log based and elliptic curve cryptography and cryptanalysis. Other advanced

Theory, Analysis of Manifolds, Dynamical Systems, Differential Equations.

MAY BE REPEATED FOR CREDIT

In addition to the numbered and titled courses shown above, the department offers a selection of advanced level Graduate Courses specifically designed to meet the needs of individuals or small groups of students at the advanced doctoral level.